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Department
Transportation
National Highway
Traffic Safety
Administration

DOT HS 806 842

Final Report

September 1984

Side-Impact Aggressiveness Attributes MDB-To-Car Side Impact Test of a 19° Crabbed Moving Deformable Barrier to a 1981 Volkswagen Rabbit at 46.4 Mph

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1. Report No. DOT HS-806 842		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle SIDE IMPACT AGGRESSIVENESS ATTRIBUTES MDB-TO-CAR SIDE IMPACT TEST OF A 19 ⁰ CRABBED MOVING DEFORMABLE BARRIER TO A 1981 VOLKSWAGEN RABBIT AT 46.4 MPH				5. Report Date SEPTEMBER 1984	
				6. Performing Organization Code	
7. Author(s) L. Bell, Project Engineer, TRCO				8. Performing Organization Report No. 840713	
9. Performing Organization Name and Address Vehicle Research and Test Center St. Rt. 33, Logan County East Liberty, Ohio 43319				10. Work Unit No. (TRAIS)	
				11. Contract or Grant No. DTNH22-82-A-08401	
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration 400 Seventh Street, S.W. Washington, DC 20590				13. Type of Report and Period Covered FINAL REPORT July - September 1984	
				14. Sponsoring Agency Code	
15. Supplementary Notes					
16. Abstract This test report documents one of a series of twelve crash tests to evaluate the side impact aggressiveness attributes of various deformable barrier face configurations. The configurations to be used are designated as "Lowered Stiffness", "Altered Profile" and "Lowered Bumper". In addition, four pole tests will be conducted. Testing was conducted on a 1981 baseline Volkswagen Rabbit 2-door hatchback at the TRCO Crash Test Facility, East Liberty, Ohio. The test vehicle was impacted on the left side by a moving deformable barrier designated as "Lowered Stiffness" crabbed to 19 ⁰ , at 46.4 mph. Occupant responses of two side impact dummies were measured. One dummy was located in the driver's designated seating position and one was located in the left rear passenger position. The test date was July 13, 1984 and the ambient temperature was 79 ⁰ F.					
17. Key Words Occupant Response Moving Barrier Crash Testing			18. Distribution Statement Document available to the public through the National Technical Information Service, Springfield, Virginia 22161		
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of Pages 157	
				22. Price	

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SECTION 1.0

PURPOSE AND INTRODUCTION

PURPOSE

The main purpose of this test was to evaluate the side impact aggressiveness of a deformable barrier face designated as "Lowered Stiffness". In all, there will be twelve crash tests involving deformable barrier faces designated as "Lowered Stiffness", "Altered Profile" and "Lowered Bumper". In addition, four pole tests will be conducted. The vehicle was tested using conditions not currently contained in a Federal Motor Vehicle Safety Standard.

INTRODUCTION

A stationary 1981 Volkswagen Rabbit 2-door hatchback was impacted on the left side by a Moving Deformable Barrier (MDB) on July 13, 1984. The test was to simulate an intersection collision with the striking vehicle traveling at 35 mph and the struck vehicle traveling at 17.5 mph. The orientation angle of the striking vehicle was 60° counterclockwise with respect to the longitudinal axis of the struck vehicle. The impact point was to be 37 inches forward of the vehicle center of gravity which is defined by accident investigation to be the midpoint of the wheelbase.

To simulate this collision, the MDB was to be towed into the stationary Volkswagen Rabbit at 46.3 mph with the MDB's wheels crabbed clockwise to 19°. The actual test speed was 46.4 mph and the actual impact point was 38.0 inches forward of the midpoint of the Volkswagen Rabbit's wheelbase. The vehicle was structurally unmodified and contained no additional padding.

Section 2 contains General Test and Vehicle Parameter Data. Section 3 contains data required by R & D. Appendix A contains pre-test and post-test vehicle and dummy photographs. Appendix B contains Data Plots.

SECTION 2.0
GENERAL TEST AND VEHICLE PARAMETER DATA

The following data sheets describe the General Test and Vehicle Parameter Data.

TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Volkswagen of America, Inc.

MAKE/MODEL: Volkswagen Rabbit

VIN: 1VWBG0179BX011002

BODY STYLE: 2-Door Hatchback

MODEL YEAR: 1981

NHTSA NO.: R & D

COLOR: Tan

ENGINE DATA: TYPE: Transverse

CYLINDERS: 4

DISPLACEMENT 97 CID

TRANSMISSION DATA: 4 Speed Manual

DATE VEHICLE RECEIVED: 6/29/84

ODOMETER READING: 93031

DEALER'S NAME AND ADDRESS: Volkswagen North
Worthington, Ohio

ACCESSORIES:

POWER STEERING	No	AUTOMATIC TRANSMISSION	No
POWER BRAKES	No	AUTOMATIC SPEED CONTROL	No
POWER SEATS	No	TILTING STEERING WHEEL	No
POWER WINDOWS	No	TELESCOPING STEERING WHEEL	No
TINTED GLASS	No	AIR CONDITIONING	No
RADIO	Yes	ANTI-SKID BRAKE	No
CLOCK	Yes	REAR WINDOW DEFROSTER	Yes
OTHER			

REMARKS:

1. IS THE VEHICLE STOCK THROUGHOUT? Yes
2. DOES VEHICLE SHOW EVIDENCE OF PRIOR ACCIDENT HISTORY? No
3. DOES VEHICLE SHOW ANY SIGNIFICANT CORROSION? No
4. CONDITION OF THE FRONT/REAR BUMPER AND FRAME: Good

DATA FROM CERTIFICATION LABEL ON LEFT DOOR FACE OR "B" POST:

VEHICLE MANUFACTURED BY: Volkswagen of America, Inc.

DATE OF MANUFACTURE: 10/80

GVWR: 2822 LBS.,

GAWR: FRONT 1609 LBS., REAR 1278 LBS.

VEHICLE TIRE DATA

RECOMMENDED COLD TIRE PRESSURE: FRONT 27 psi; REAR 31 psi

TIRES ON VEHICLE (MFGR. & LINE, SIZE): Michelin P 155/80R13

BIAS PLY, BELTED, OR RADIAL: Radial

PLY RATING: 4

IS SPARE TIRE "SPACE SAVER"? No

IS SPARE TIRE STANDARD EQUIPMENT? Yes

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (WITH MAXIMUM FLUIDS):

RIGHT FRONT	640	LBS.	RIGHT REAR	340	LBS.
LEFT FRONT	650	LBS.	LEFT REAR	345	LBS.
TOTAL FRONT WEIGHT	1290		LBS. (65.3 % OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	685		LBS. (34.7 % OF TOTAL VEHICLE WEIGHT)		
TOTAL DELIVERED WEIGHT	1975		LBS.		

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE:	RF 24 1/16	;LF 24 3/8	;RR 23 13/16	;LR 24 3/16
PRE-TEST ATTITUDE:	RF 24 3/16	;LF 23 3/4	;RR 21 13/16	;LR 21 1/2
POST-TEST ATTITUDE:	RF 25 3/8	;LF 23 3/8	;RR 21 11/16	;LR 20 3/8

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 0 LBS. CARGO:

RIGHT FRONT	685	LBS.	RIGHT REAR	545	LBS.
LEFT FRONT	685	LBS.	LEFT REAR	575	LBS.
TOTAL FRONT WEIGHT	1370		LBS. (55.0 % OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	1120		LBS. (45.0 % OF TOTAL VEHICLE WEIGHT)		
TOTAL TEST WEIGHT	2490		LBS.		

WEIGHT OF BALLAST SECURED IN VEHICLE TRUNK AREA: 0 LBS.

TEST FLUID DATA

TEST FLUID TYPE: RED STODDARD SOLVENT #2; SPEC. GRAVITY: 0.764

KINEMATIC VISCOSITY: 0.99 CENTISTOKES

"USEABLE" CAPACITY*: NA GALLONS

TEST VOLUME: 8.0 GALLONS

FUEL SYSTEM CAPACITY (DATA FROM OWNERS MANUAL): 10.0 GALLONS

DETAILS OF FUEL SYSTEM: DNA

ELECTRIC FUEL PUMP: No

FUEL INJECTION: Yes

DOES ELECTRIC FUEL PUMP OPERATE WITH IGNITION SWITCH "ON" AND THE ENGINE NOT OPERATING? DNA

DATA FROM "RECOMMENDED TIRE PRESSURE" LABEL ON DOOR, POST, GLOVEBOX, ETC.

VEHICLE LOAD (UP TO CAPACITY): FRONT 27 psi; REAR 31 psi

RECOMMENDED TIRE SIZE: 155 SR 13 LOAD RANGE X B, C,

VEHICLE CAPACITY: TYPES OF SEATS: Front - Bucket
Rear - Bench

NUMBER OF OCCUPANTS (DESIGNATED SEATING CAPACITY): 2 FRONT

2 REAR

CARGO LOAD 185 LBS.

4 TOTAL

TOTAL 785 LBS.

*WITH ENTIRE FUEL SYSTEM FILLED WITH FUEL TANK THROUGH CARBURETOR BOWL.

TEST CONDITIONS

TEST NUMBER: 840713

DATE OF TEST: July 13, 1984

TIME OF TEST: 10:00

WIND VELOCITY: 3-6 mph NW

HUMIDITY: 46%

AMBIENT TEMPERATURE AT IMPACT AREA: 79° F

TEMPERATURE IN OCCUPANT COMPARTMENT: 78° F

SUBJECT VEHICLE DATA

	<u>ACTUAL</u>	<u>INTENDED</u>
VEHICLE TEST WEIGHT (LBS.)	2508	2490
MDB TEST WEIGHT (LBS.)	2990	3000
MDB VELOCITY (MPH)*	46.4	46.3
IMPACT POINT (INCHES)**	38.0	37

DUMMIES

	<u>DRIVER</u>	<u>MIDDLE PASSENGER</u>	<u>RT. FRONT PASSENGER</u>	<u>LEFT REAR PASSENGER</u>	<u>RT. REAR PASSENGER</u>
TYPE:	SID			SID	
SERIAL NO.:	06			U02	
INSTRUMENTATION:					
HEAD ACCEL.:	Yes			Yes	
CHEST ACCEL.:	Yes (Upper/Lower)			Yes (Upper/Lower)	
FEMUR L.C.'S:	No			No	
OTHER:	Pelvis/Ribs			Pelvis/Ribs	

RESTRAINT SYSTEM: Both dummies were unrestrained

* As measured over final one foot of travel.

** As measured forward of the midpoint of the vehicle's wheelbase.

VISIBLE DUMMY CONTACT POINTS:

	DRIVER 06	PASSENGER U02
Head	<u>Driver Sill, Seat Back, Ground</u>	<u>Roof, Side Header</u>
Chest	<u>Inner Door Panel, Ground</u>	<u>Inner Quarter Panel</u>
Abdomen	<u>Inner Door Panel, Ground</u>	<u>Front Seat Back, Inner Quarter Panel</u>
Left Knee	<u>Dash, Separated At Impact</u>	<u>Front Seat Back, Inner Quarter Panel</u>
Right Knee	<u>Dash, Separated At Impact</u>	<u>Front Seat Back, Left Knee</u>

DOOR OPENING:

	LEFT	RIGHT
Front	<u>Separated During Test</u>	<u>NA</u>
Rear	<u>DNA</u>	<u>DNA</u>

SEAT MOVEMENT:

	SEAT BACK FAILURE	SEAT SHIFT
Front	<u>Yes</u>	<u>NA</u>
Rear	<u>No</u>	<u>No</u>

GLAZING DAMAGE:

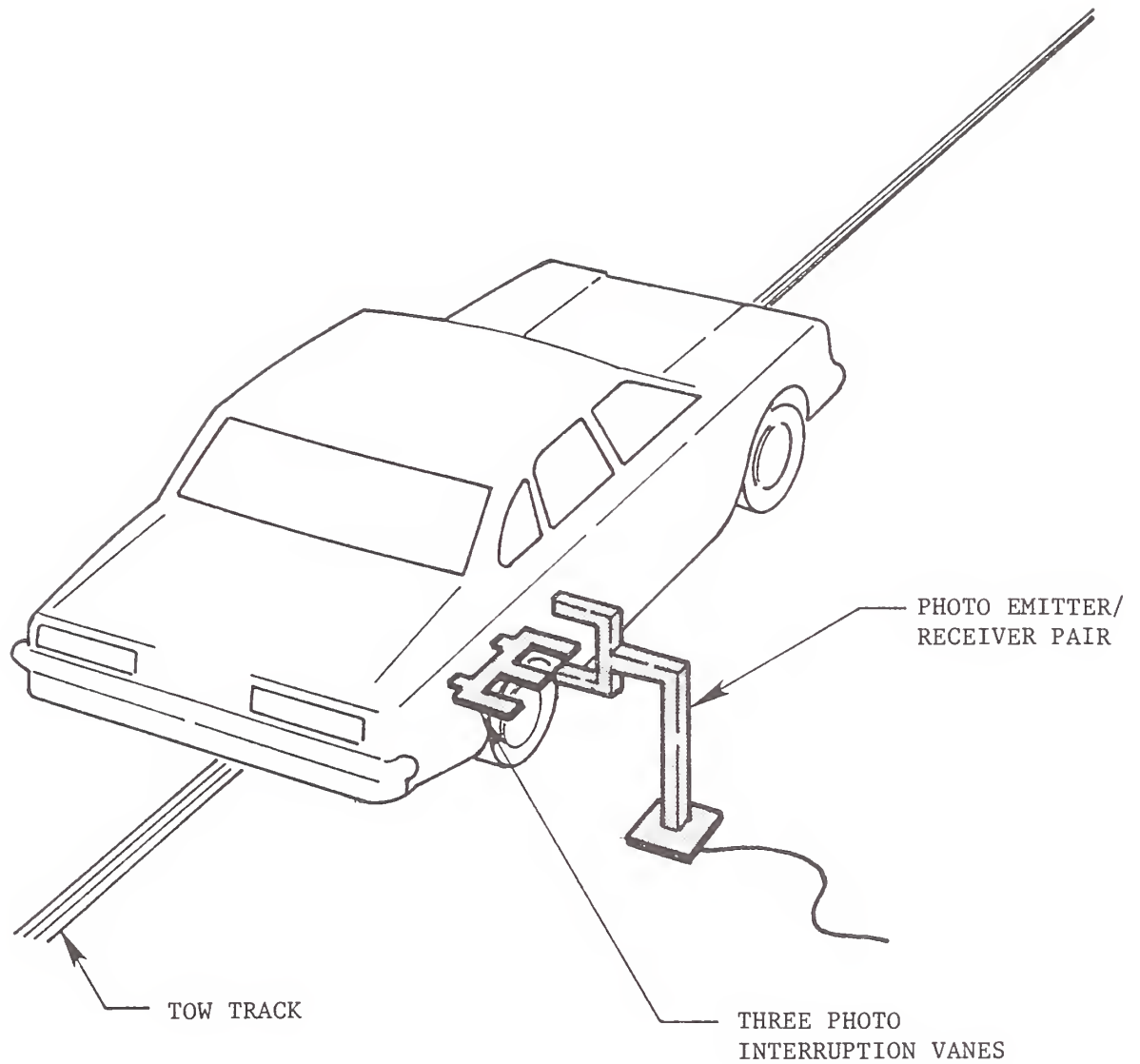
Windshield shattered.

OTHER NOTABLE IMPACT EFFECTS:

Driver travelled outside the vehicle after impact,

landing on the ground.

IMPACT VELOCITY MEASUREMENT SYSTEM



The final vane is located two inches before impact.

The vanes have one foot spacing.

VEHICLE TEST WEIGHT CALCULATION

$$\begin{aligned}\text{Test Weight} &= \text{Unloaded Delivered Weight} + \\ &\quad \text{Number of Dummies X 174 lbs.} + \\ &\quad \text{Cargo Weight} \\ &= 1975 + 2 \times 174 + 185 \text{ lbs.} \\ &= 2508 \text{ lbs.}\end{aligned}$$

To achieve test weight, 8.0 gallons of Stoddard Solvent was added in the fuel tank. The weight of the test vehicle was measured by placing each wheel on a Loadmeter Corporation Hiway Loadometer.

TEST ANOMALIES

The Left Front Door Accelerometer in Position 11, LFDYG5, was found to have a physical problem, possibly due to excessive strain on the front door.

SECTION 3.0
DATA REQUIRED BY R & D

The following pages are included in this section:

1. Dummy temperature control and position data
2. Dummy kinematic summary
3. Vehicle crush data
4. Dummy and vehicle accelerometer location and data summary
5. High speed camera information
6. Transducer information

DUMMY TEMPERATURE CONTROL AND POSITIONING

The vehicle was kept inside the temperature controlled crash test building until approximately 2 hours prior to the test. Temperature inside the vehicle and ambient temperature at the crash area were recorded. Dummy temperature while outside the crash test building was maintained portably until approximately 1 minute prior to the test.

The following table summarizes the steps taken to position the instrumented, calibrated dummies in the test vehicle.

DUMMY PLACEMENT AND POSITIONING

SIDE IMPACT DUMMY

DRIVER DSP

REAR PASSENGER DSP

HEAD	Surface of transverse instrument mounting platform is as horizontal as possible without inducing torso movement & midsagittal plane falls in longitudinal plane.	Surface of transverse instrument mounting platform is as horizontal as possible without inducing torso movement & midsagittal plane falls in longitudinal plane.
UPPER TORSO	Placed against seat back. Midsagittal plane is vertical and centered behind steering column.	Placed against seat back. Midsagittal plane is vertical and contained in the same longitudinal plane as the driver's midsagittal plane.
LOWER TORSO	Midsagittal plane is vertical and centered behind steering column.	Midsagittal plane is vertical and contained in the same longitudinal plane as the driver's midsagittal plane.
UPPER LEGS (thighs or femurs)	Placed against seat cushion. Planes defined by femur and tibia centerlines are as close as possible to vertical.	Placed against seat cushion. Planes defined by femur and tibia centerlines are as close as possible to vertical.
KNEES	Knees set 14.5" apart between pivot bolt head outer surfaces. Outer surface of right knee pivot bolt is 8.6" from midsagittal plane of dummy. Outer surface of left knee pivot bolt is 5.9" from midsagittal plane of dummy.	Located so that planes defined by femur and tibia centerlines are as close as possible to vertical.
LOWER LEGS	Plane defined by femur and tibia centerlines are as close as possible to vertical longitudinal plane.	Plane defined by femur and tibia centerlines are as close as possible to vertical longitudinal plane.
RIGHT FOOT	Placed on undepressed accelerator pedal -- rearmost point of heel on floorplan in plane of pedal.	Centerline falls in vertical longitudinal plane. Placed on floor as far forward as possible without front seat interference.
LEFT FOOT	Placed on toeboard -- rearmost point of heel on floorpan as close as possible to intersection of toeboard and floorpan. Centerline falls in vertical longitudinal plane.	Centerline falls in vertical longitudinal plane. Placed on floor as far forward as possible without front seat interference.

*NOTE: THE SIDE IMPACT DUMMY DOES NOT INCLUDE ARMS.

DUMMY IN-VEHICLE POSITION RECORDING SHEET

VEHICLE NHTSA NO. R & D

MFR./MAKE/MODEL: Volkswagen Rabbit

FRONT SEAT TYPE: X BENCH
 BUCKET
 SPLIT BENCH

ADJUSTER TYPE: X MANUAL
 POWER

BUCKET SEAT BACK TYPE: FIXED
 X ADJUSTABLE

TECHNICIANS:

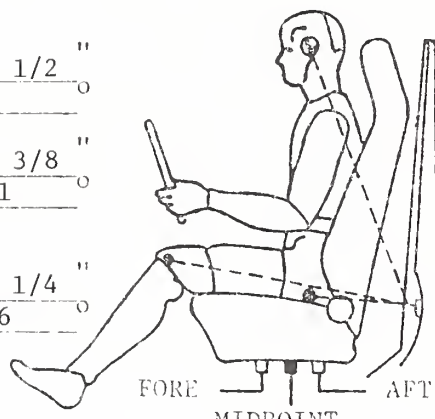
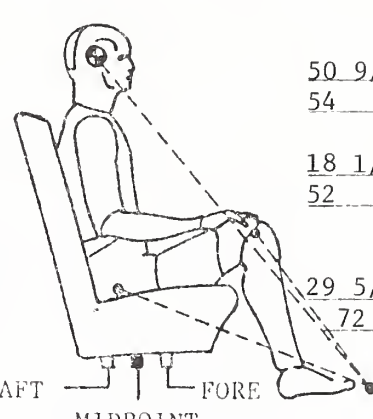
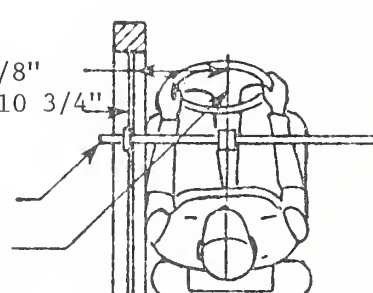
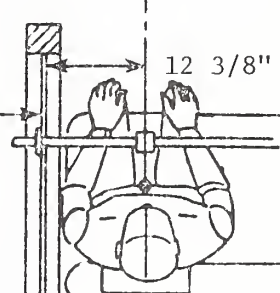
1. B. Miller

2. D. LeVally

3. M. Garrison

POSITIONING DATE: 7/13/84

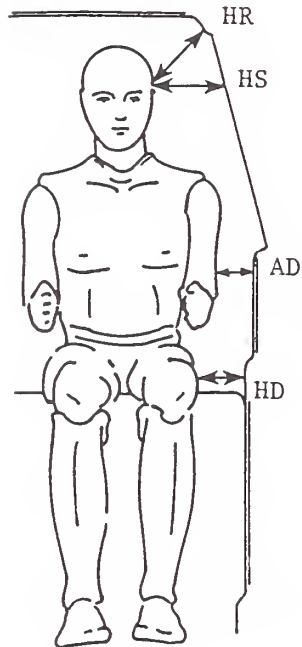
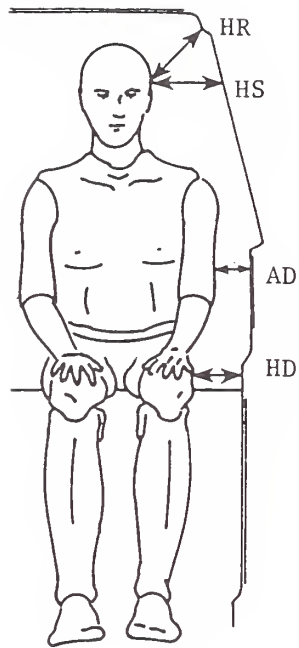
AMBIENT TEMP.: 70° F. TIME: 5:30

<p>DRIVER DUMMY # <u>06</u></p>  <p>HEAD <u>19 1/2</u> " TARGET*<u>35</u> "</p> <p>KNEE <u>32 3/8</u> " JOINT <u>101</u> "</p> <p>APPROX. "H" <u>18 1/4</u> " POINT <u>126</u> "</p> <p>FORE MIDPOINT AFT</p>	<p>REAR PASSENGER DUMMY # <u>U02</u></p>  <p><u>50 9/16</u> "HEAD <u>54</u> "TARGET**</p> <p><u>18 1/16</u> "KNEE <u>52</u> "JOINT</p> <p>APPROX. <u>29 5/16</u> "H" <u>72</u> "POINT</p> <p>AFT MIDPOINT FORE</p>
<p>DOOR GLASS <u>10 7/8</u> " HEIGHT*** <u>10 3/4</u> "</p>  <p>LATERAL BAR ADJUSTABLE POINTER</p> <p>DRIVER DUMMY # <u>06</u></p>	<p>DOOR GLASS <u>12 3/8</u> " HEIGHT <u> </u> DNA</p>  <p>PASSENGER DUMMY # <u>U02</u></p>

*All driver dummy dimensions referenced to top of striker bolt and all angles referenced to vertical.

**All passenger dummy dimensions referenced to front seat back latch bolt with front seat in mid-position and all angles referenced to vertical.

***Door glass height is equal on the right and left side of vehicle at dummy nose level.



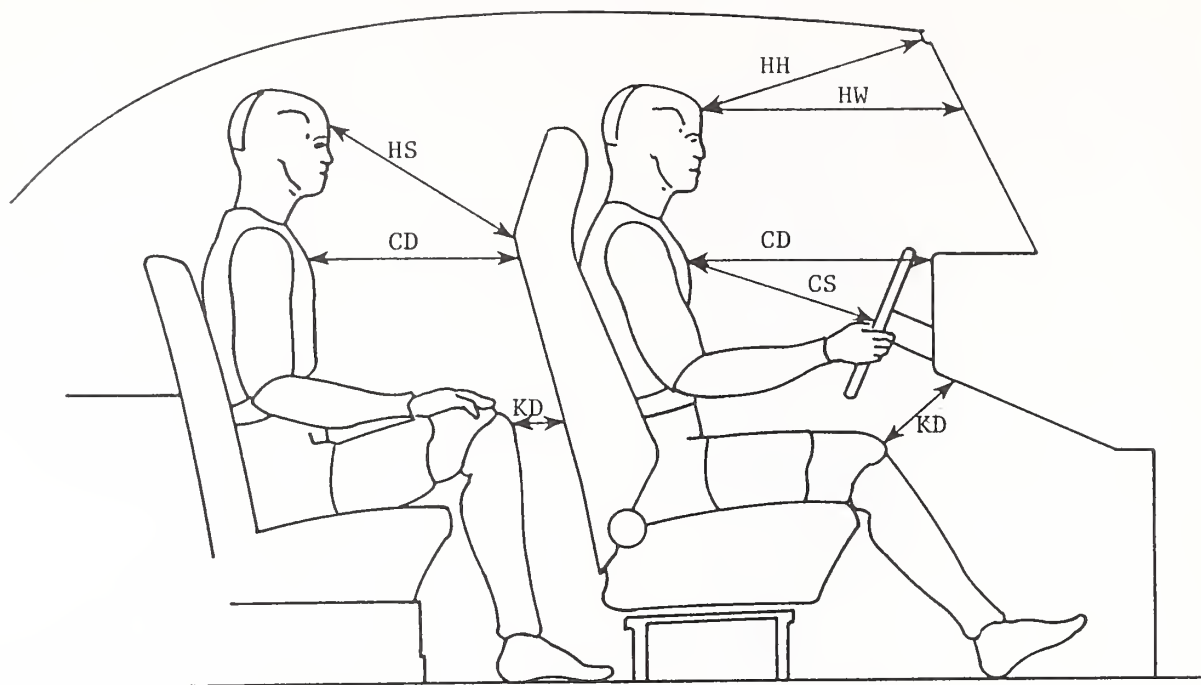
DRIVER
06

PASSENGER
U02

HR	6 1/2	7 3/8
HS	7 5/8	9 7/8
AD	4 1/2	5 1/2
HD	6 1/2	6 1/8

ALL MEASUREMENTS IN INCHES

DUMMY LATERAL CLEARANCE DIMENSIONS



DRIVER
06

PASSENGER
U02

HH	13 7/8	DNA
HW	20 1/2	DNA
HS	DNA	23 1/4
CD	20 1/16	17 1/16
CS	12 3/16	DNA
KDL	5 3/16	3 13/16
KDR	4 9/16	3 7/8

ALL MEASUREMENTS IN INCHES

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

DUMMY KINEMATIC SUMMARY

DRIVER

During impact, the dash panel below the steering column burst inward, hitting the dummy's knees. The left hip of the dummy contacted the inner panel as the door caved in. As the buttocks swung to the right, the dummy's left shoulder and chest contacted the window sill and door panel. The head went outside the vehicle's boundaries as the torso travelled to the passenger side of the car. The buttocks travelled outside the passenger's front window and the legs detached at the knees. As the body rotated toward the right the dummy travelled back to the driver's side of the car in a head first spiral. The dummy continued to travel outside the car as the driver's door separated from the vehicle. After contacting the asphalt and rolling approximately 1 1/2 times, the dummy came to rest lying on his back.

PASSENGER

During impact, the back of the driver's seat contacted the passenger's knees. At the same time, the B-pillar crushed in, hitting the dummy's left knee and calf. As the left leg and hip rebounded from the door panel towards the right, the dummy's torso leaned left. The passenger's head then hit the roof above the window as the driver's seat continued to come back, trapping the lower legs between the B-pillar and the seat back. The dummy came to rest in a partially upright position with his legs trapped to the left and his upper torso leaning right toward the far side passenger position.

VEHICLE EXTERIOR PROFILES AND STATIC CRUSH

ZERO DISTANCE AT PROJECTED IMPACT POINT*

LOCATION	HEIGHT (in)	6	0	6	12	18	24	30	36	42	48	54	60	66	72	78
		PRE-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)														
Axle Height	11.0	X	X	19.8	19.2	19.8	19.9	19.9	19.9	20.0	20.1	20.1	20.1	20.3	X	X
H-Point	20.8	X	15.9	18.0	18.0	18.0	17.9	17.9	17.9	17.9	17.9	18.0	18.3	18.3	18.4	18.5
Mid Door	24.2	15.8	16.9	17.8	16.8	16.8	16.8	16.7	16.6	16.7	16.8	16.9	17.0	17.1	17.3	16.0
Window Sill	34.5	X	18.9	19.8	18.4	18.3	18.4	18.4	18.4	18.4	18.5	18.6	18.7	18.8	19.0	19.0
Window Top	54.3	X	X	X	X	X	27.9	27.8	27.6	27.6	27.7	27.8	27.9	28.2	28.7	X

POST-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)

Axle Height	11.0	X	X	23.1	26.7	27.2	28.1	28.4	28.5	28.7	30.9	29.2	26.2	23.3	X	X
H-Point	20.8	X	22.6	23.6	X	X	X	X	X	X	X	36.0	32.6	29.9	26.6	26.1
Mid Door	24.2	20.9	22.3	X	X	X	X	X	X	X	X	36.9	33.8	30.6	28.5	25.8
Window Sill	34.5	X	20.3	19.2	X	X	X	X	X	X	X	37.3	33.5	29.0	26.3	23.6
Window Top	54.3	X	X	X	X	X	26.9	27.0	27.6	28.1	29.3	28.8	27.9	27.4	27.5	X

STATIC CRUSH (IN)

Axle Height	11.0	X	X	3.3	7.5	7.4	8.2	8.5	8.6	8.7	10.8	9.1	6.1	3.0	X	X
H-Point	20.8	X	6.7	5.6	X	X	X	X	X	X	X	18.0	14.3	11.6	8.2	7.6
Mid Door	24.2	5.1	5.4	X	X	X	X	X	X	X	X	20.0	16.8	13.5	11.2	9.8
Window Sill	34.5	X	1.4	-0.6	X	X	X	X	X	X	X	18.7	14.8	10.2	7.3	4.6
Window Top	54.3	X	X	X	X	X	-1.0	-0.8	0.0	0.5	1.6	1.0	0.0	-0.8	-1.2	X

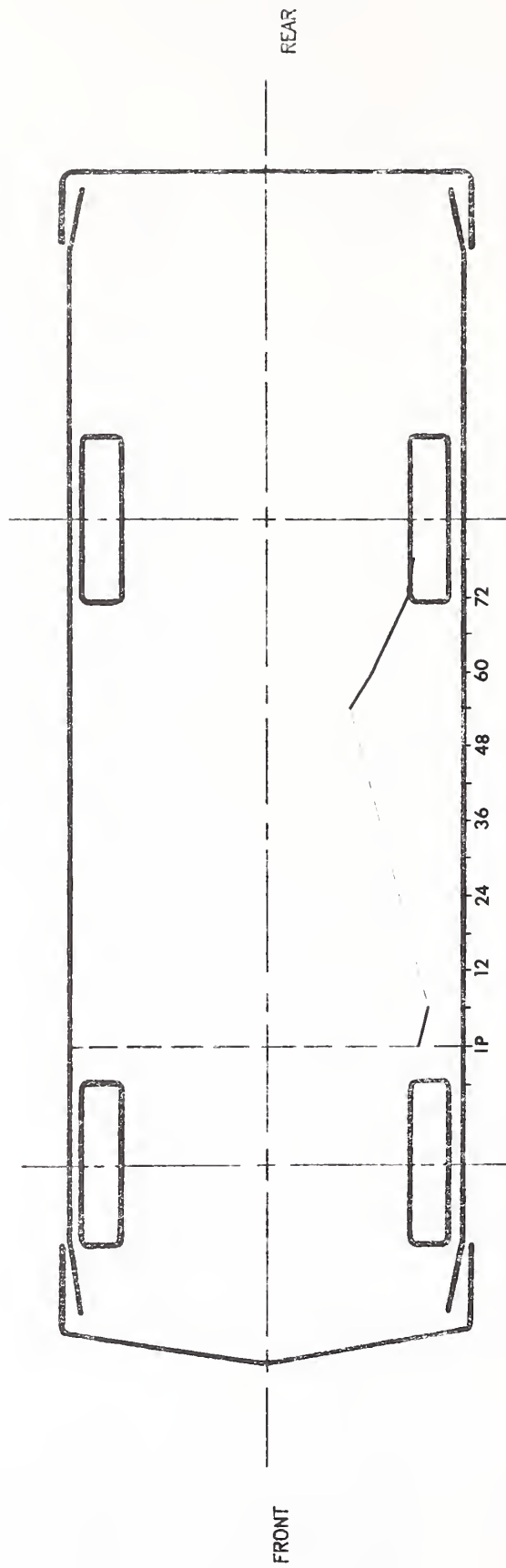
* Projected impact point is 37 inches forward of driver's side wheelbase midpoint. Column readings are front to rear from left to right.

** Reference plane is parallel to and 48 inches from the vehicle longitudinal centerline.

NOTE: Upon impact, the driver side door separated from the test vehicle.

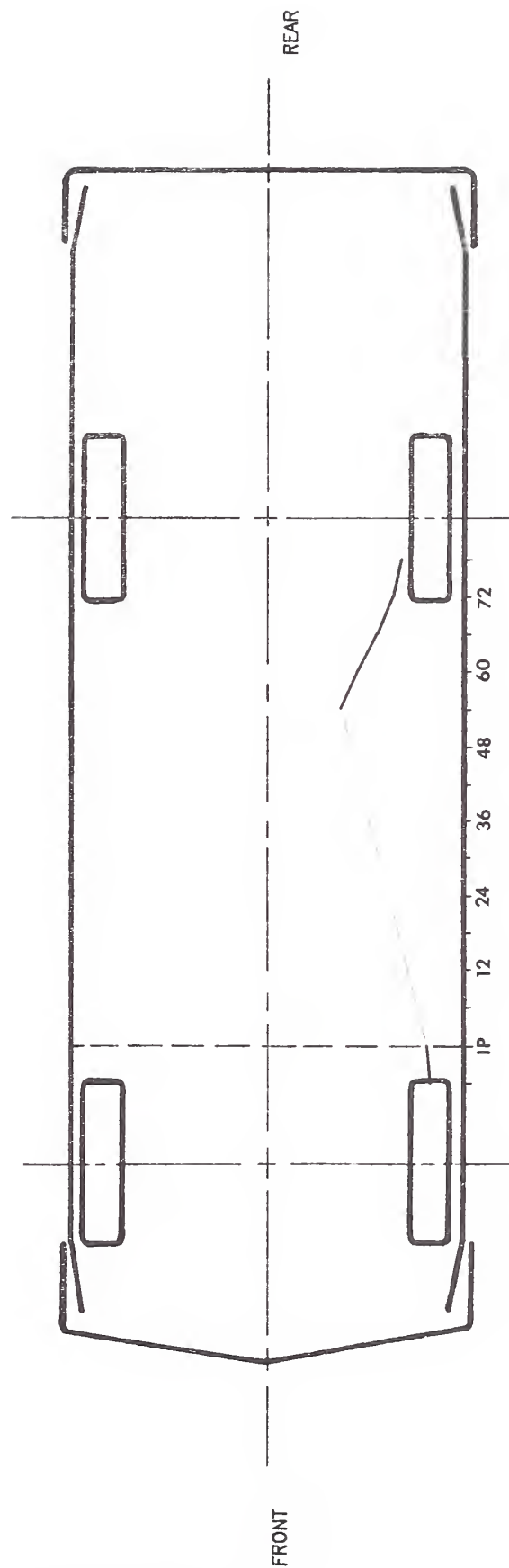
3-9

VEHICLE EXTERIOR STATIC CRUSH PROFILE



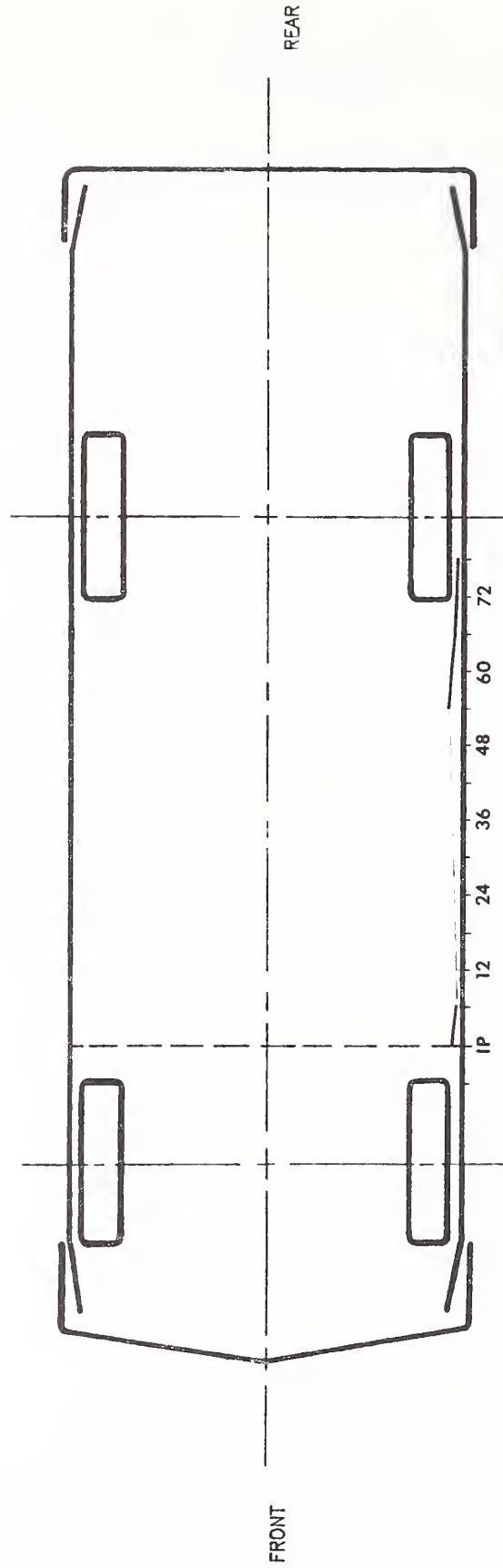
PROFILE LEVEL EQUALS H-POINT HEIGHT
IP EQUALS PROJECTED IMPACT POINT

VEHICLE EXTERIOR STATIC CRUSH PROFILE



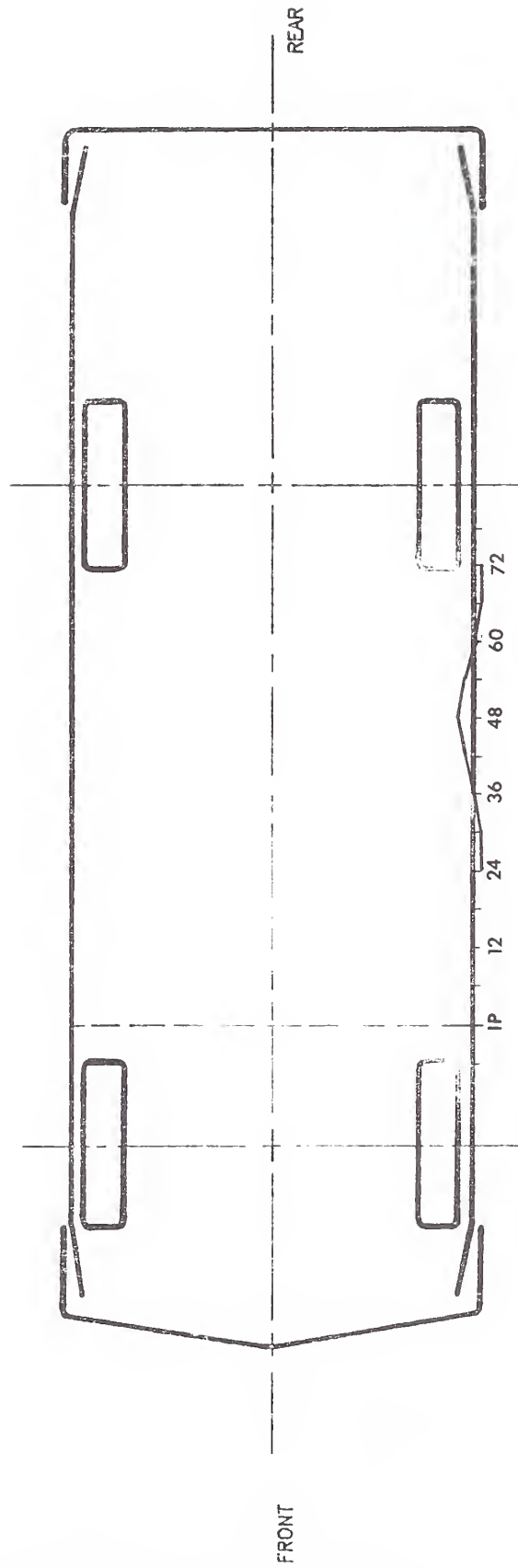
PROFILE LEVEL EQUALS MID-DOOR HEIGHT
IP EQUALS PROJECTED IMPACT POINT

VEHICLE EXTERIOR STATIC CRUSH PROFILE



PROFILE LEVEL EQUALS WINDOW SILL HEIGHT
 IP EQUALS PROJECTED IMPACT POINT

VEHICLE EXTERIOR STATIC CRUSH PROFILE



PROFILE LEVEL EQUALS WINDOW TOP HEIGHT
 IP EQUALS PROJECTED IMPACT POINT

SIDE IMPACT DUMMY DATA SUMMARY

	DRIVER DUMMY				PASSENGER DUMMY			
	POSITIVE		NEGATIVE		POSITIVE		NEGATIVE	
	DIRECTION*		DIRECTION**		DIRECTION*		DIRECTION**	
	MAX (g)	TIME (msec)	MAX (g)	TIME (msec)	MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
HEAD ACCELERATION								
LONGITUDINAL	41.48	150.13	179.82	88.63	19.45	93.25	92.51	85.00
LATERAL	78.05	68.38	37.14	80.63	98.91	81.75	23.06	95.50
VERTICAL	21.68	43.25	114.45	78.13	140.47	88.88	58.43	78.38
RESULTANT		197.79 @	88.38			162.31 @	85.13	
HIC	3990.50	from 62.50 to 94.50			2546.00	from 78.00 to 92.25		
CHEST ACCELERATION								
UPPER SPINE								
LONGITUDINAL	26.77	80.63	86.85	55.00	11.09	74.38	114.26	81.25
LATERAL (P)***	182.02	53.12	38.53	46.88	165.19	80.63	17.40	71.25
LATERAL (R)***	192.93	53.12	37.55	46.88	152.65	80.63	18.78	71.25
VERTICAL	23.25	41.87	26.99	58.75	12.52	60.62	25.08	91.87
RESULTANT (P)		197.65 @	53.75			198.44 @	81.25	
RESULTANT (R)		207.89 @	53.75			189.25 @	81.25	
DELTA V (MPH)****		31.3 @	63.13 (P)			26.0 @	106.88 (P)	
		34.6 @	63.75 (R)			25.6 @	106.88 (R)	
LOWER SPINE								
LONGITUDINAL	74.87	59.38	42.94	52.50	40.22	93.13	55.33	76.25
LATERAL (P)	157.84	50.63	30.39	71.25	107.69	80.00	30.43	93.13
LATERAL (R)	161.13	51.88	65.43	66.25	111.79	80.63	30.38	93.75
VERTICAL	40.77	53.12	5.34	70.63	39.65	76.88	12.29	96.25
RESULTANT (P)		165.87 @	51.25			119.53 @	77.50	
RESULTANT (R)		171.05 @	51.88			121.23 @	77.50	
DELTA V (MPH)		45.7 @	63.13 (P)			36.8 @	89.38 (P)	
		42.9 @	63.13 (R)			38.6 @	90.00 (R)	
LEFT UPPER RIB								
LATERAL (P)	167.70	46.88	13.09	41.25	134.51	75.62	7.62	96.88
LATERAL (R)	163.93	46.88	13.42	41.25	127.51	75.62	11.49	96.88
DELTA V (MPH)		41.4 @	76.25 (P)			28.9 @	95.63 (P)	
		41.4 @	76.25 (R)			30.5 @	95.63 (R)	
LEFT LOWER RIB								
LATERAL (P)	208.20	45.62	32.73	70.00	156.97	74.37	82.05	63.13
LATERAL (R)	196.89	45.62	49.65	70.00	168.66	74.37	27.97	96.25
DELTA V (MPH)		43.3 @	67.50 (P)			24.8 @	93.13 (P)	
		42.8 @	66.88 (R)			32.1 @	93.13 (R)	
PELVIS ACCELERATION								
LONGITUDINAL	85.79	74.13 °	136.38	48.25	21.76	56.50	92.47	69.25
LATERAL	256.21	40.50	273.46	74.63 °	145.00	69.25	53.99	50.88
VERTICAL	80.03	48.88	123.90	74.50 °	30.47	96.50	15.13	98.38
RESULTANT		306.07 @	74.63 °			171.98 @	69.25	
DELTA V (MPH)		30.7 @	72.00 °			30.9 @	90.75	

SIDE IMPACT DUMMY DATA SUMMARY CONTD

	<u>DRIVER DUMMY</u>				<u>PASSENGER DUMMY</u>			
	<u>POSITIVE</u>		<u>NEGATIVE</u>		<u>POSITIVE</u>		<u>NEGATIVE</u>	
	<u>DIRECTION*</u>		<u>DIRECTION**</u>		<u>DIRECTION*</u>		<u>DIRECTION**</u>	
	<u>MAX</u>	<u>TIME</u>	<u>MAX</u>	<u>TIME</u>	<u>MAX</u>	<u>TIME</u>	<u>MAX</u>	<u>TIME</u>
	<u>(in)</u>	<u>(msec)</u>	<u>(in)</u>	<u>(msec)</u>	<u>(in)</u>	<u>(msec)</u>	<u>(in)</u>	<u>(msec)</u>
RIB DEFLECTION †	1.82	70.38	--- ε	--- ε	1.03	90.50	0.21	129.63

* LONGITUDINAL:	FORWARD	**LONGITUDINAL:	REARWARD
LATERAL:	RIGHTWARD	LATERAL:	LEFTWARD
VERTICAL:	UPWARD	VERTICAL:	DOWNWARD

*** (P) = Primary Sensor, (R) = Redundant Sensor

**** For dummy channels, Delta V is the velocity change at the approximate time of separation from the contact area.

† Compression: Positive

ε There were no negative values in the time interval of interest.

○ The CTM has judged that intermittent rattling has occurred in these channels and, therefore, the peak values reported are questionable as are applicable resultants and Delta V's.

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
1	RIGHT SILL AT FRONT SEAT (LONGITUDINAL)	82.9	22.9	10.1				
	(LATERAL)				2.17	41.75	7.69	57.63
	(VERTICAL)				12.46	67.00	3.52	135.88
	(RESULTANT)				10.03	57.63	5.45	32.75
						14.26 @	74.63	
2	RIGHT SILL AT REAR SEAT (LONGITUDINAL)	60.4	23.4	8.8				
	(LATERAL)				2.20	42.00	6.73	98.88
	(VERTICAL)				17.63	57.50	3.21	137.00
	(RESULTANT)				5.60	60.75	4.11	106.75
						19.04 @	57.63	
3	REAR DECK OVER AXLE (LONGITUDINAL)	32.3	0.0	7.3				
	(LATERAL)				4.46	109.13	20.46	62.88
	(VERTICAL)				24.80	79.38	2.13	142.63
	(RESULTANT)				11.96	85.75	25.76	64.50
						39.34 @	64.13	
4	LEFT SILL AT REAR SEAT (LATERAL)	60.0	-23.6	8.6				
					28.43	55.13	30.02	78.50
5	LEFT SILL AT FRONT SEAT (LATERAL)	82.7	-23.7	10.0				
					48.85	56.25	50.92	92.63
6	LEFT FRONT DOOR CENTERLINE (LATERAL)	80.9	-26.8	23.1				
					105.16	37.00	116.41	43.63
7	RIGHT REAR COMPARTMENT (LONGITUDINAL)	31.3	15.4	14.4				
					3.39	43.00	10.43	61.75
8	MIDREAR OF LEFT FRONT DOOR (LATERAL)	60.9	-26.1	23.3				
					171.23	34.13	97.27	65.88
9	UPPER LEFT FRONT DOOR CENTERLINE (LATERAL)	82.0	-26.1	32.3				
					129.80	29.75	299.47	49.25
10	MIDFRONT OF LEFT FRONT DOOR (LATERAL)	99.5	-25.9	22.0				
					141.13	12.63	82.78	34.38
11	UPPER REAR OF LEFT REAR DOOR (LATERAL)	71.1	-26.2	32.3				
					187.39	59.88	313.25	50.25

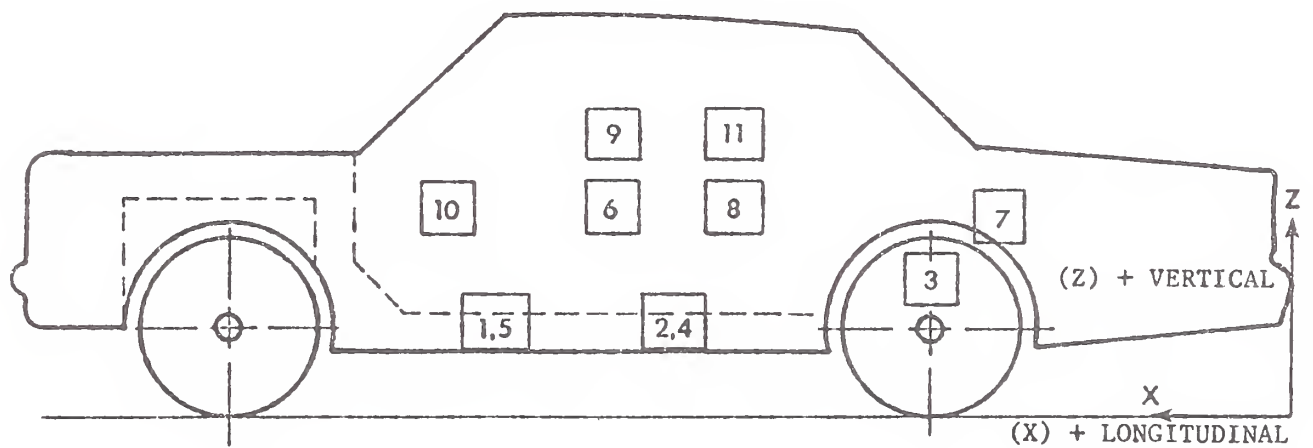
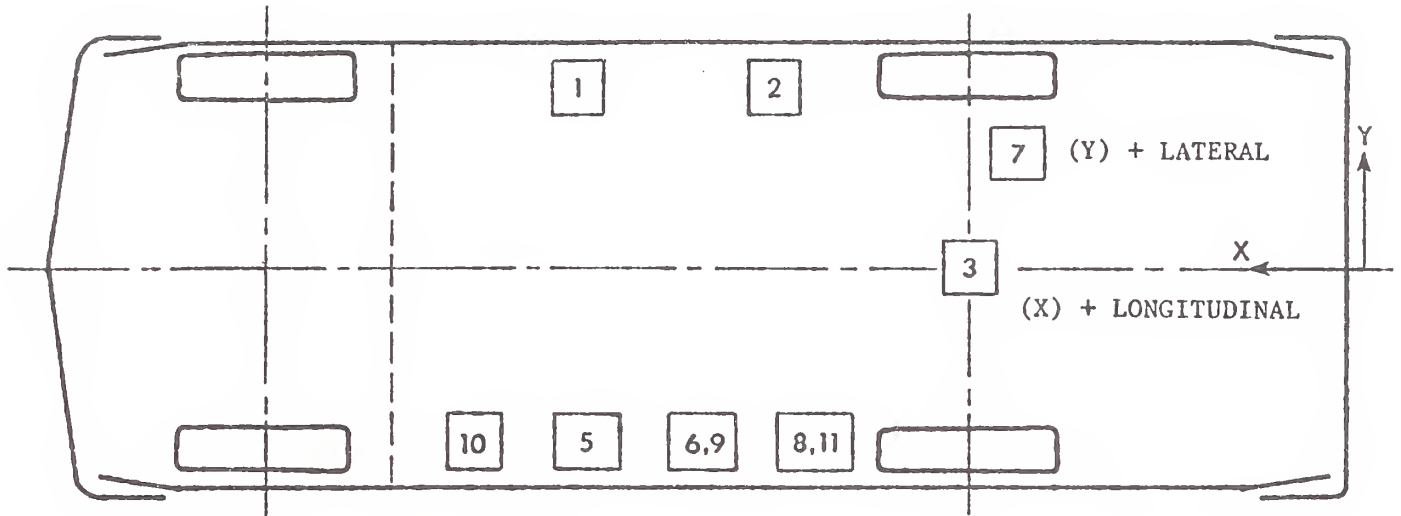
* Reference: X - Rear Bumper (+ Forward), Y - Vehicle Centerline (+ To Right),
Z - Ground Level (+ Up)

All measurements of accelerometer locations in inches.

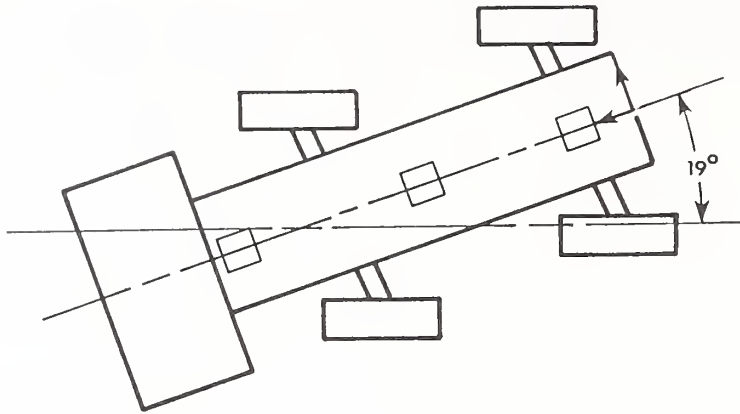
Y See TEST ANOMALIES

τ This Delta V appears unrealistic after initial velocity change.

VEHICLE ACCELEROMETER LOCATIONS



MOVING BARRIER ACCELEROMETER LOCATIONS AND DATA SUMMARY



NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
1	CENTER OF GRAVITY	74.5	0.0	11.5				
	(LONGITUDINAL)	$\Delta V = -18.6 \text{ mph @ } 165.88 \text{ msec}$			---	---	12.92	57.50
	(LATERAL)	$\Delta V = -4.7 \text{ mph @ } 165.88 \text{ msec}$			2.93	27.38	5.87	87.50
	(VERTICAL)				11.29	72.13	9.68	89.63
	(RESULTANT)				17.23 @ 72.13			
2	FRONT FRAME MEMBER	130.3	0.0	11.3				
	(LONGITUDINAL)	$\Delta V = -19.9 \text{ mph @ } 165.88 \text{ msec}$			2.83	131.88	12.82	78.75
3	REAR FRAME MEMBER	23.3	0.0	11.5				
	(LONGITUDINAL)	$\Delta V = -17.4 \text{ mph @ } 165.88 \text{ msec}$			0.29	157.50	12.22	57.38

* Reference: X - Rear Most Point of Frame (+ To Forward), Y - Barrier Centerline (+ To Right), Z - Ground Level (+ To Up)

All measurements of accelerometer locations in inches.

ε There were no positive values in the time interval of interest.

HIGH SPEED CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Overhead	Photosonic 1B	8	475	Vehicle dynamics
2	Overhead	Photosonic 1B	25	520	Close-up of impact point
3	Onboard MDB	Photosonic 1B	25	500	Close-up of impact point
4	Onboard MDB	Stalex	13	497	Driver kinematics
5	Ground level - right	Hycam	25	500	Overall view
6	Ground level - left	Photosonic 1B	17	526	Overall view
7	Onboard vehicle	Photosonic 1B	8	782	Driver kinematics - front view
8	Onboard vehicle	Photosonic 1B	8	795	Driver kinematics
9	Onboard vehicle	Photosonic 1B	8	787	Passenger kinematics

NOTE: CAMERAS ARE NUMBERED ACCORDING TO SPLICING SEQUENCE OF FILM.
 (24 fps) REAL TIME MOVIE FILM COVERAGE OF PRE-CRASH, POST-CRASH
 AND CRASH EVENT SPLICED AT START AND END OF FILM.

LOCATIONS OF OFFBOARD HIGH SPEED CAMERAS

CAMERA NO.	X	Y	Z
1	0	0	25'
2	0	0	25'
5	26'4"	60'	45"
6	-19'7"	-11'3"	45"

Origin of Coordinate System is Point of Impact

+X = Forward with Respect to Striking Vehicle's Velocity Vector
+Y = Rightward with Respect to Striking Vehicle's Velocity Vector
+Z = Upward with Respect to Striking Vehicle's Velocity Vector

NON-GOVERNMENT FURNISHED TRANSDUCER INFORMATION

PARAMETER BEING MEASURED	TYPE OF TRANSDUCER	MODEL NUMBER	SERIAL NUMBER	MFGR.	DATE OF LAST CALIBRATION	SENSITIVITY	DESIRED FULL SCALE (ENGR. UNITS)
BCGXG	Accel	4-202-0001	18845	Bell Howell	5/2/84	0.237 MV/G	50 G
BCGYG	Accel	4-202-0001	18858	Bell Howell	5/2/84	0.236 MV/G	50 G
BCGZG	Accel	4-202-0001	18857	Bell Howell	5/2/84	0.239 MV/G	50 G
BFCXG	Accel	4-202-0001	18240	Bell Howell	5/2/84	0.239 MV/G	50 G
BRCXG	Accel	4-202-0001	19022	Bell Howell	5/2/84	0.220 MV/G	50 G

All dummy and struck vehicle accelerometers were Government Furnished Equipment and were Endevco 2264 Accelerometers.

APPENDIX A

PHOTOGRAPHS



Figure A-1. PRE-TEST OVERALL - VIEW 1



Figure A-2. PRE-TEST OVERALL - VIEW 2
A-2

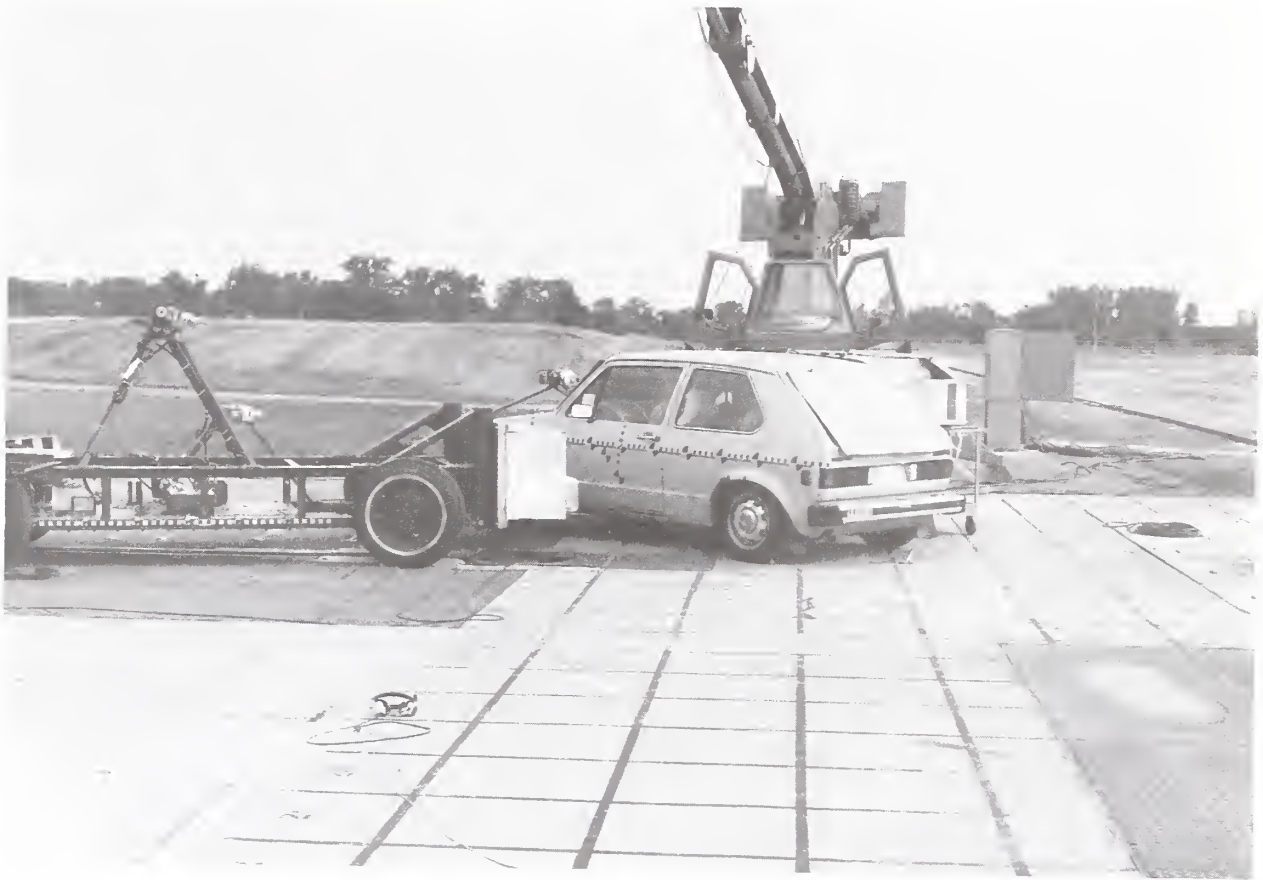


Figure A-3. PRE-TEST OVERALL -- VIEW 3

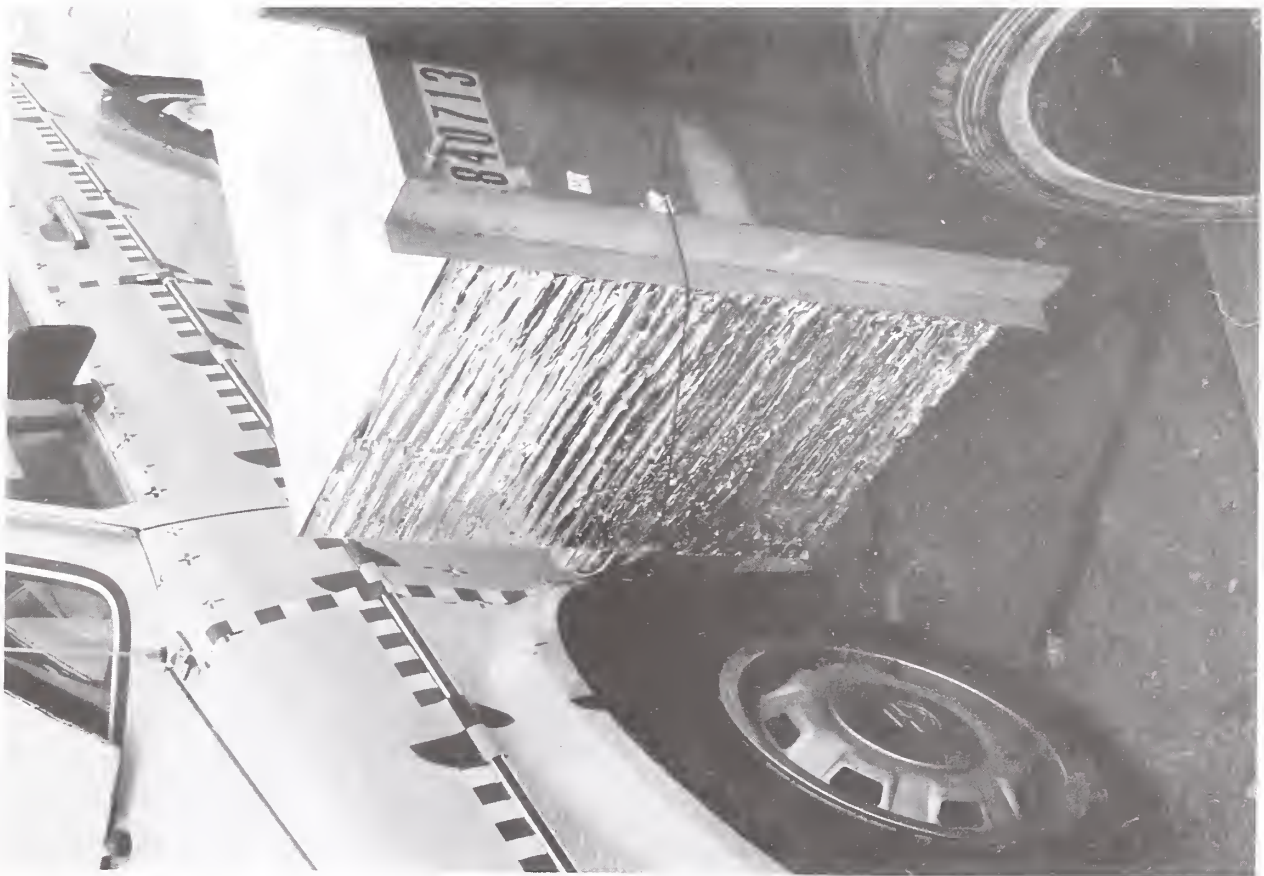


Figure A-4. PRE-TEST CLOSEUP -- VIEW 1
A-3



Figure A-5. PRE-TEST CLOSEUP - VIEW 2



Figure A-6. PRE-TEST CLOSEUP - VIEW 3
A..4

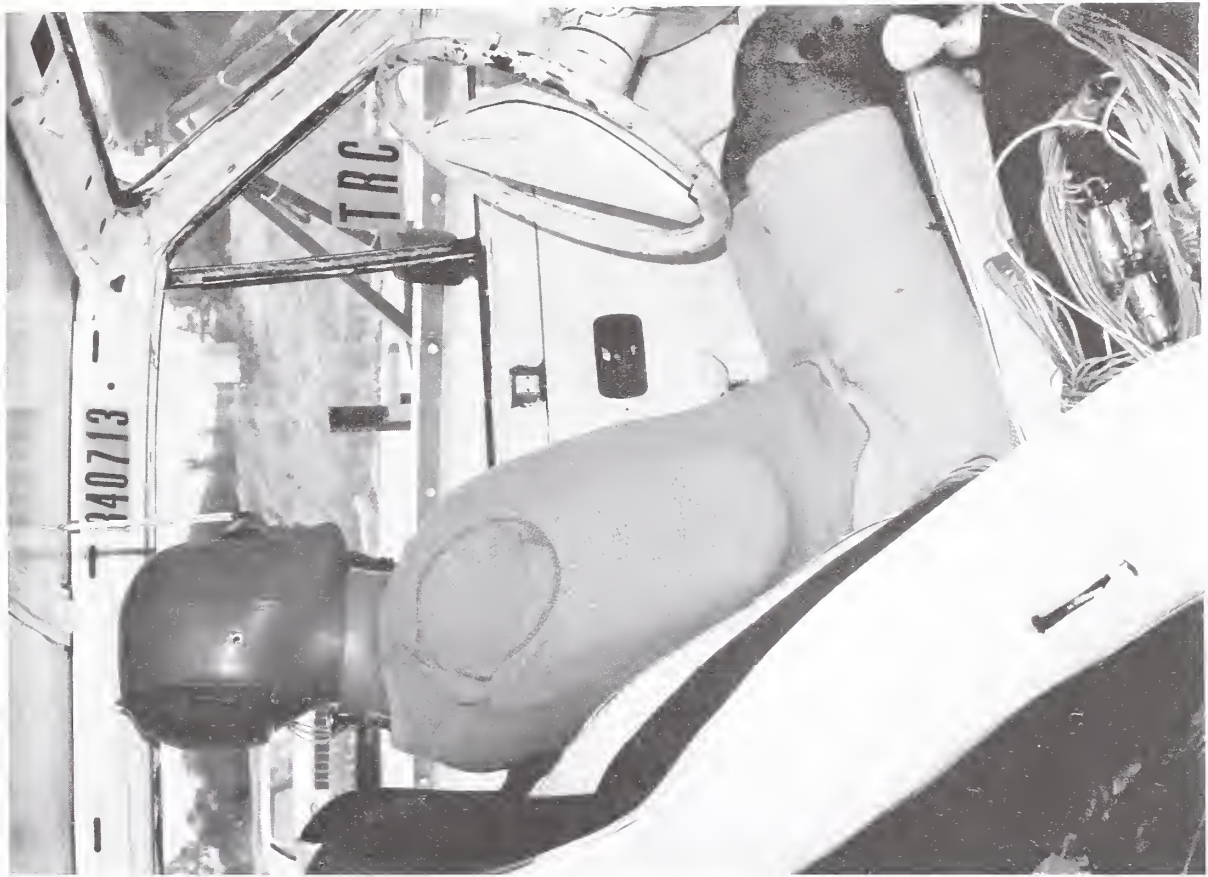


Figure A-7. PRE-TEST DRIVER DUMMY VIEW 1

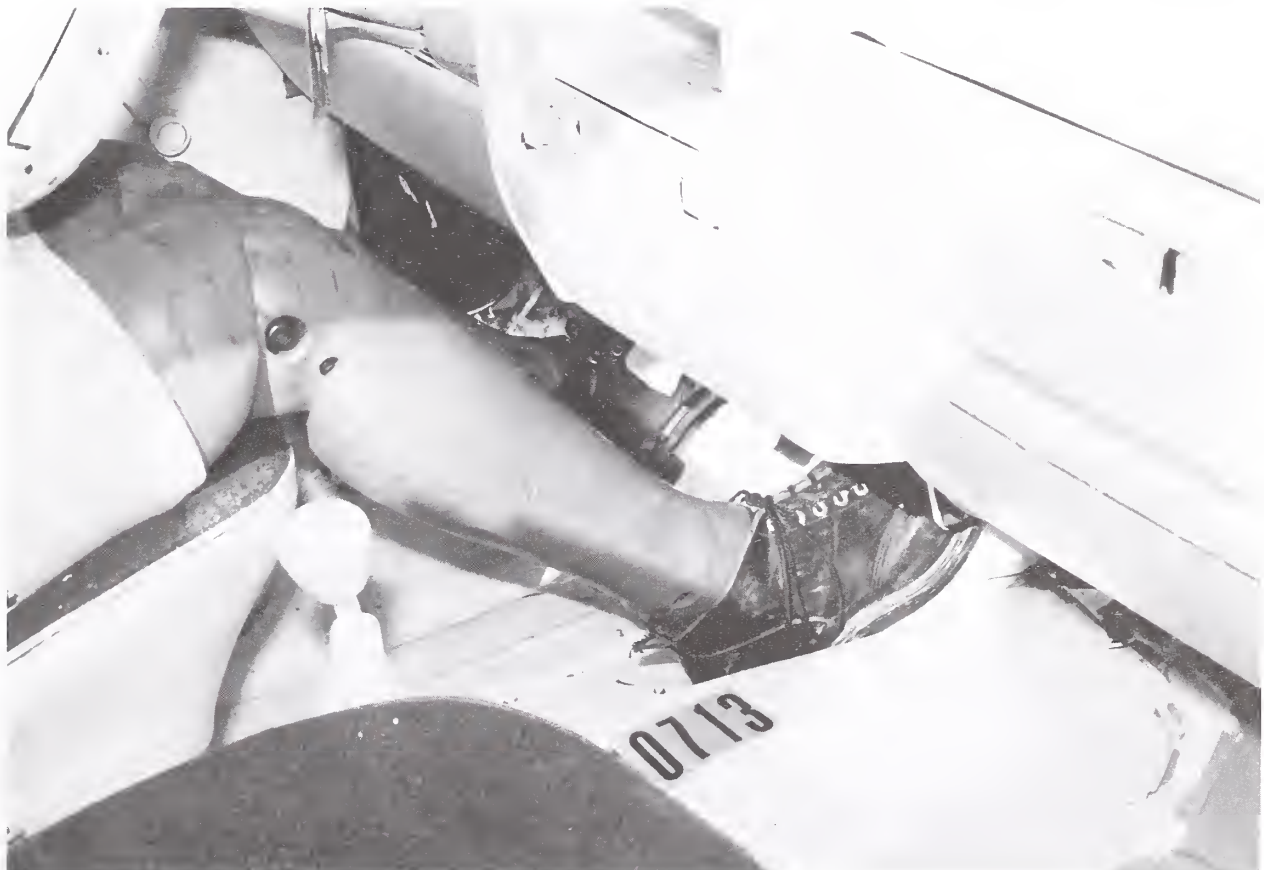


Figure A-8. PRE-TEST DRIVER DUMMY - VIEW 2
A-5



Figure A-9. PRE-TEST PASSENGER DUMMY - VIEW 1

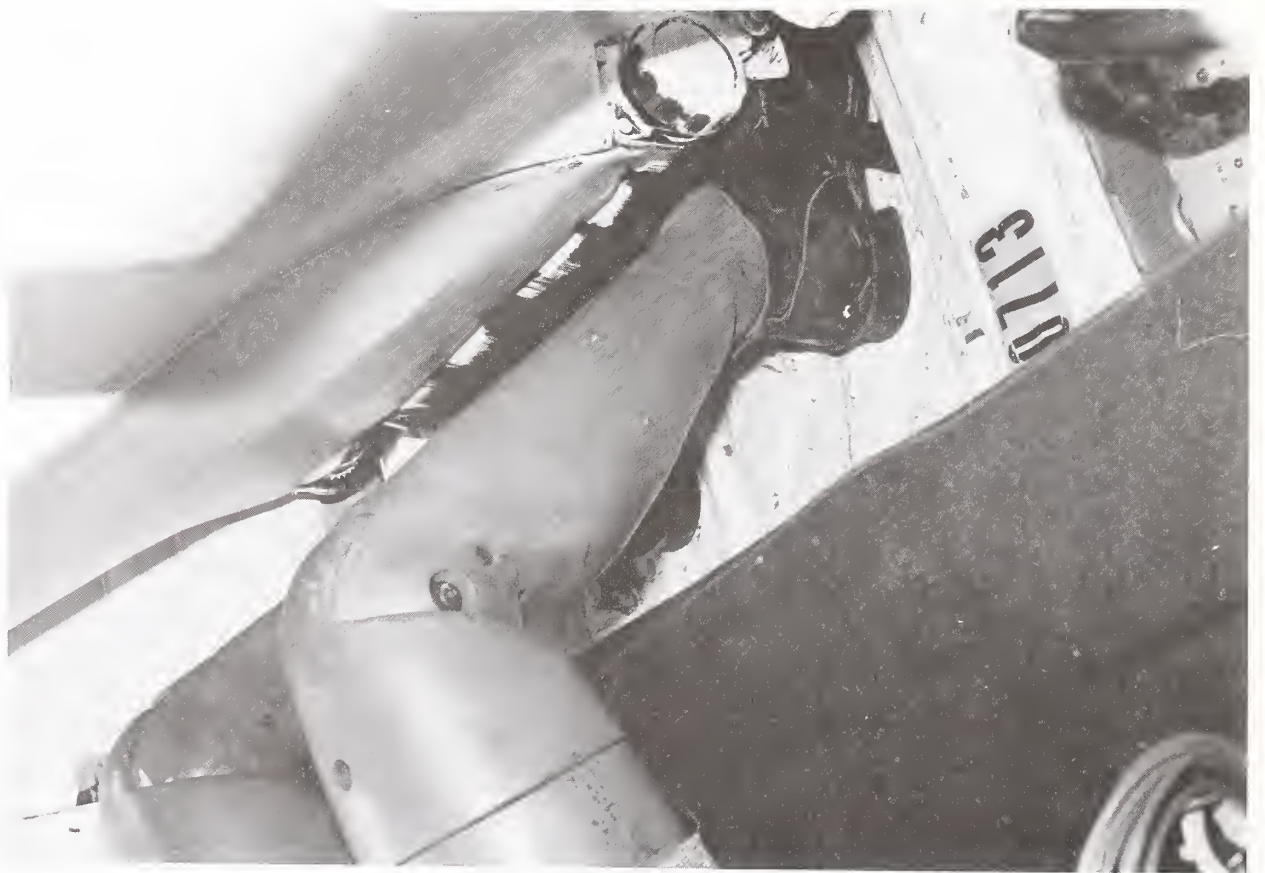


Figure A-10. PRE-TEST PASSENGER DUMMY - VIEW 2



Figure A-11. CRASH EVENT PHOTOGRAPH

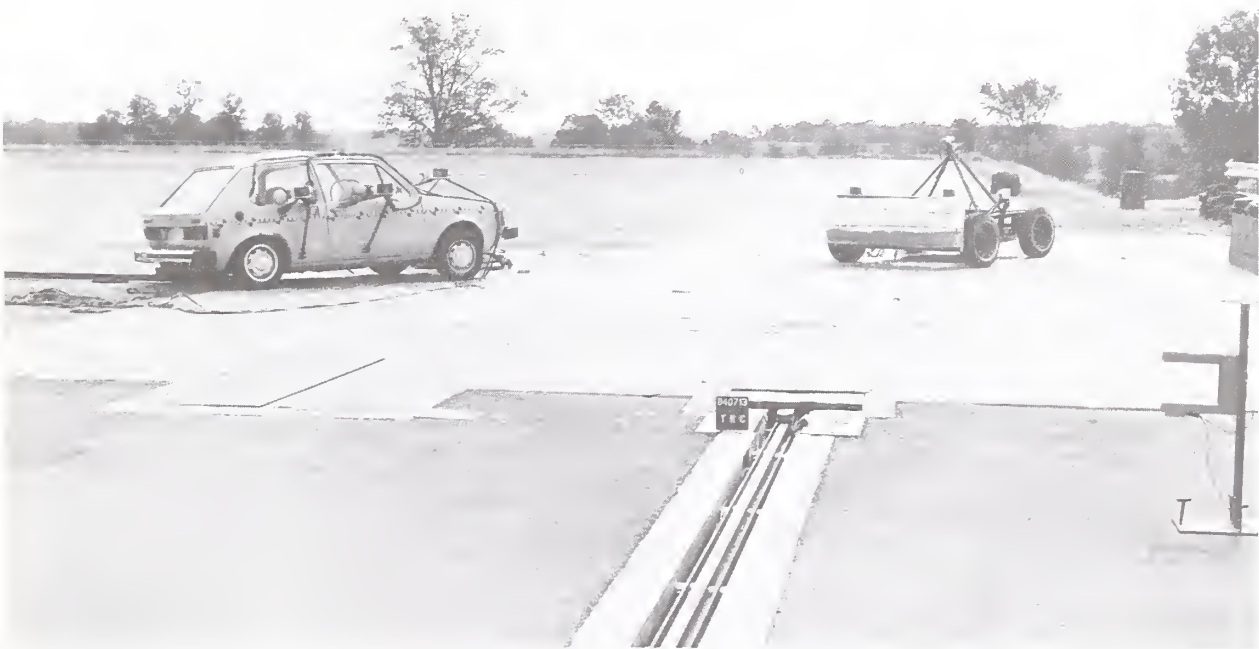


Figure A-12. POST-TEST OVERALL - VIEW 1
A-7



Figure A-13. POST-TEST OVERALL - VIEW 2

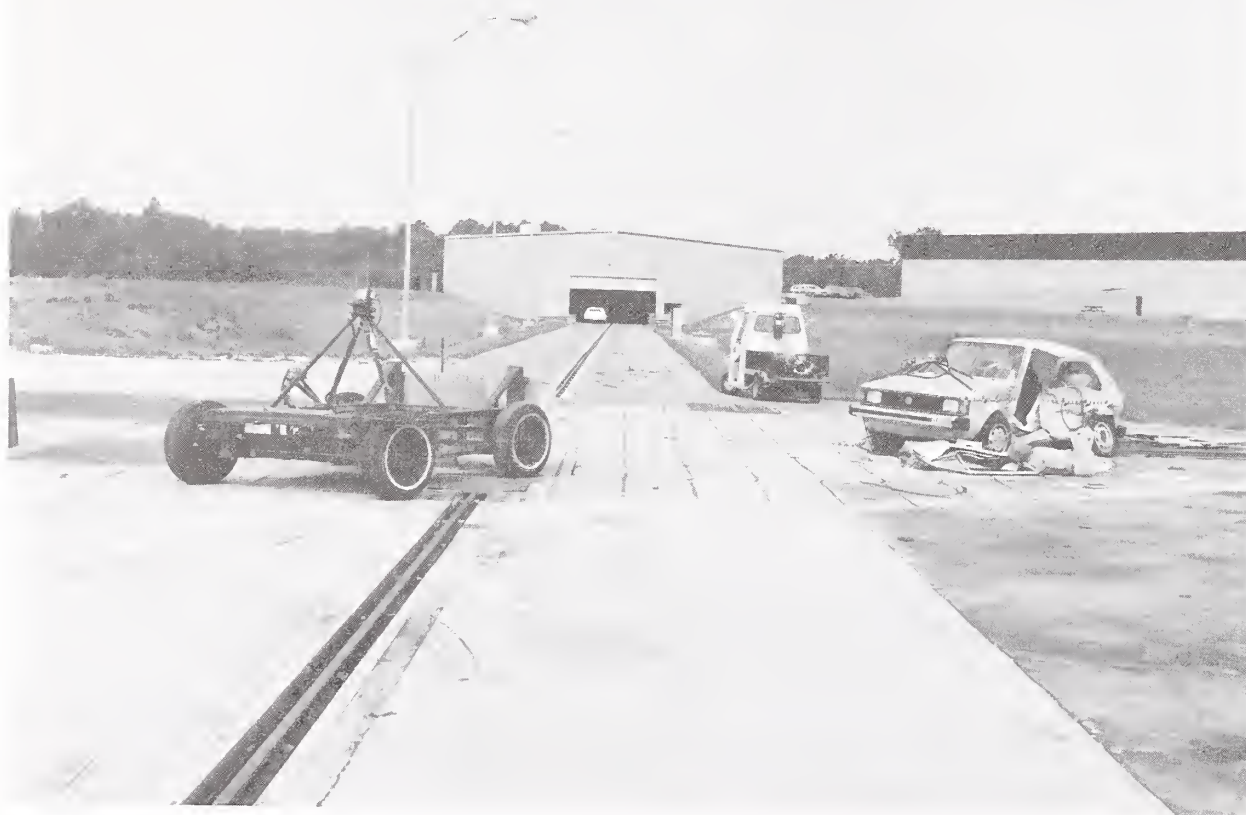


Figure A-14. POST-TEST OVERALL - VIEW 3
A-8



Figure A-15. POST-TEST OVERALL - VIEW 4

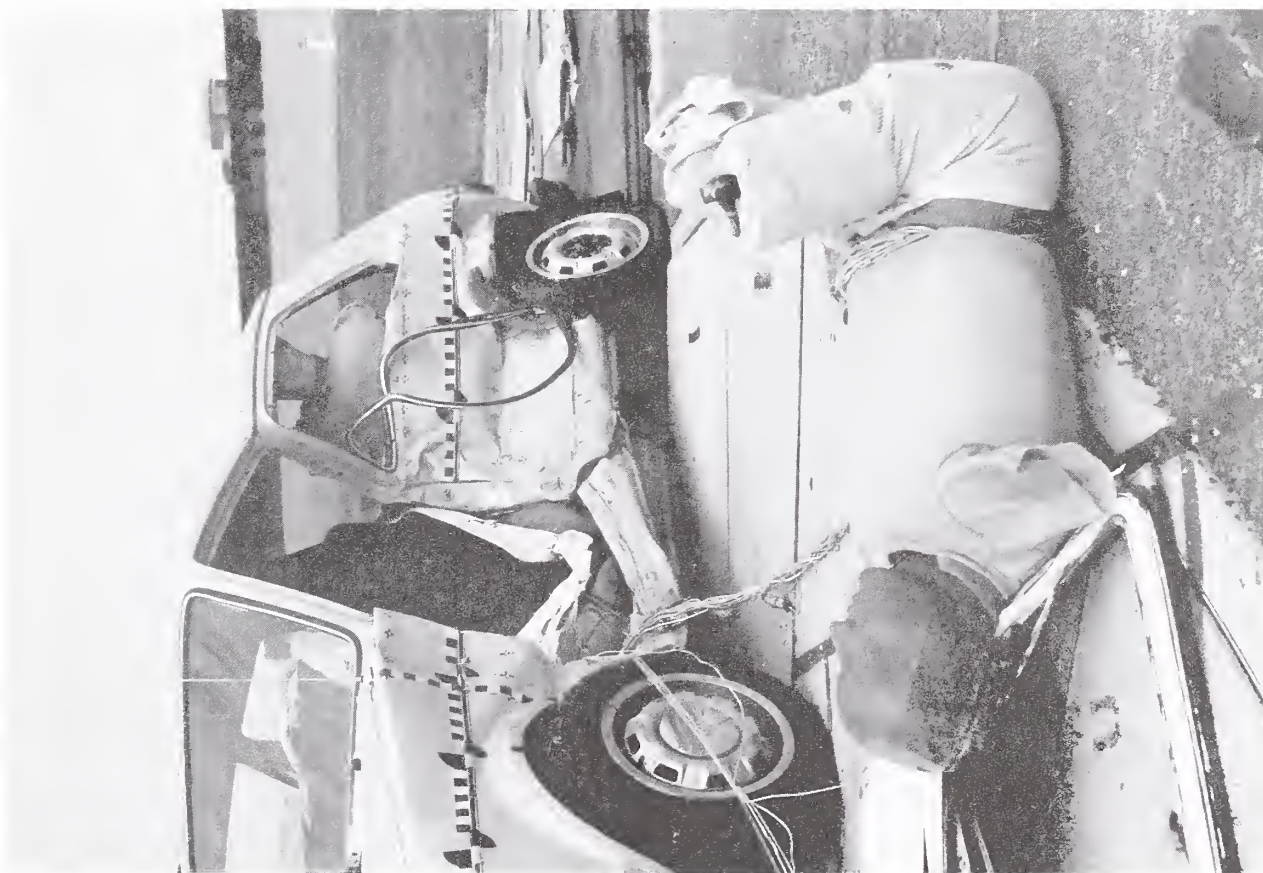


Figure A-16. POST-TEST DRIVER DUMMY - VIEW 1
A-9



Figure A-17. POST-TEST DRIVER DUMMY - VIEW 2



Figure A-18. POST-TEST PASSENGER DUMMY -- VIEW 1
A-10



Figure A-19. POST-TEST PASSENGER DUMMY - VIEW 2



Figure A-20. POST-TEST PASSENGER DUMMY - VIEW 3



Figure A-21. POST-TEST VEHICLE DAMAGE

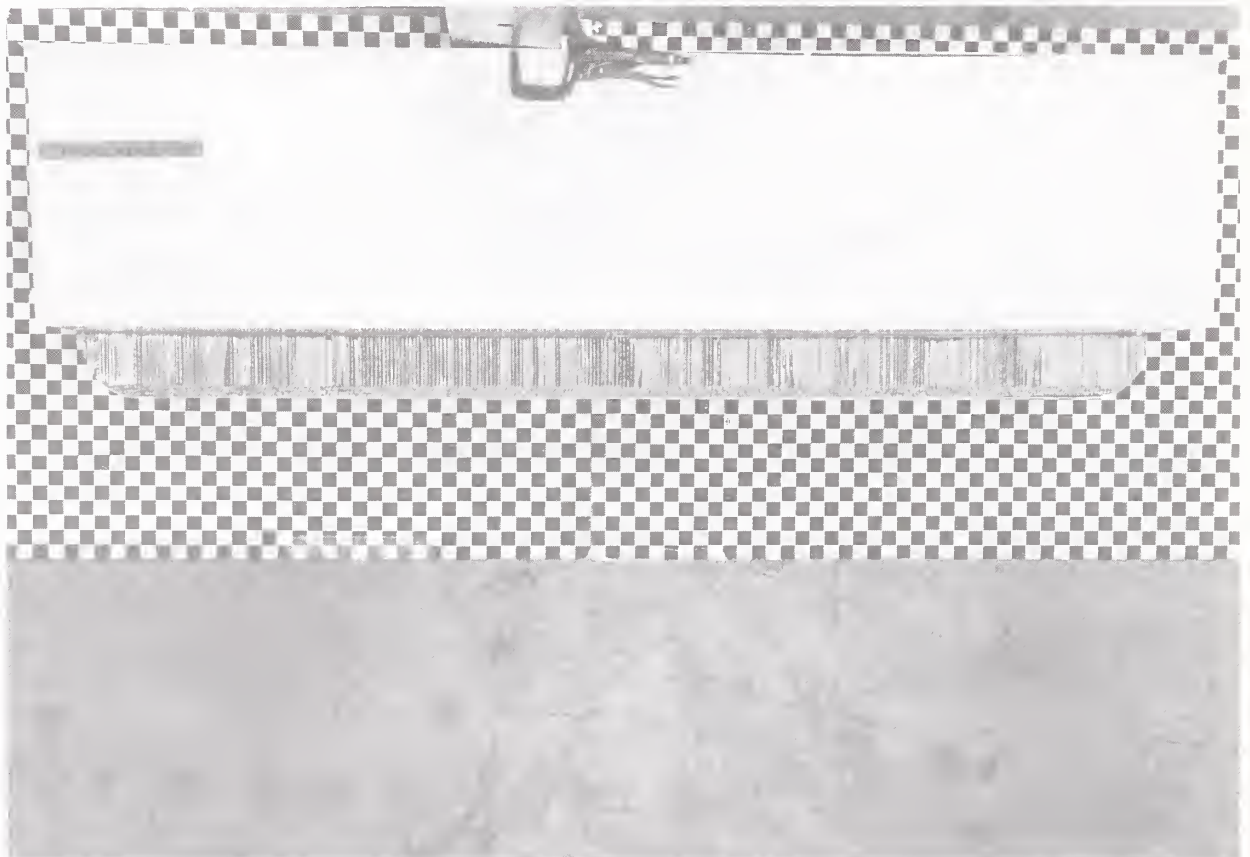


Figure A-22. PRE-TEST MDB FACE - VIEW 1
A-12

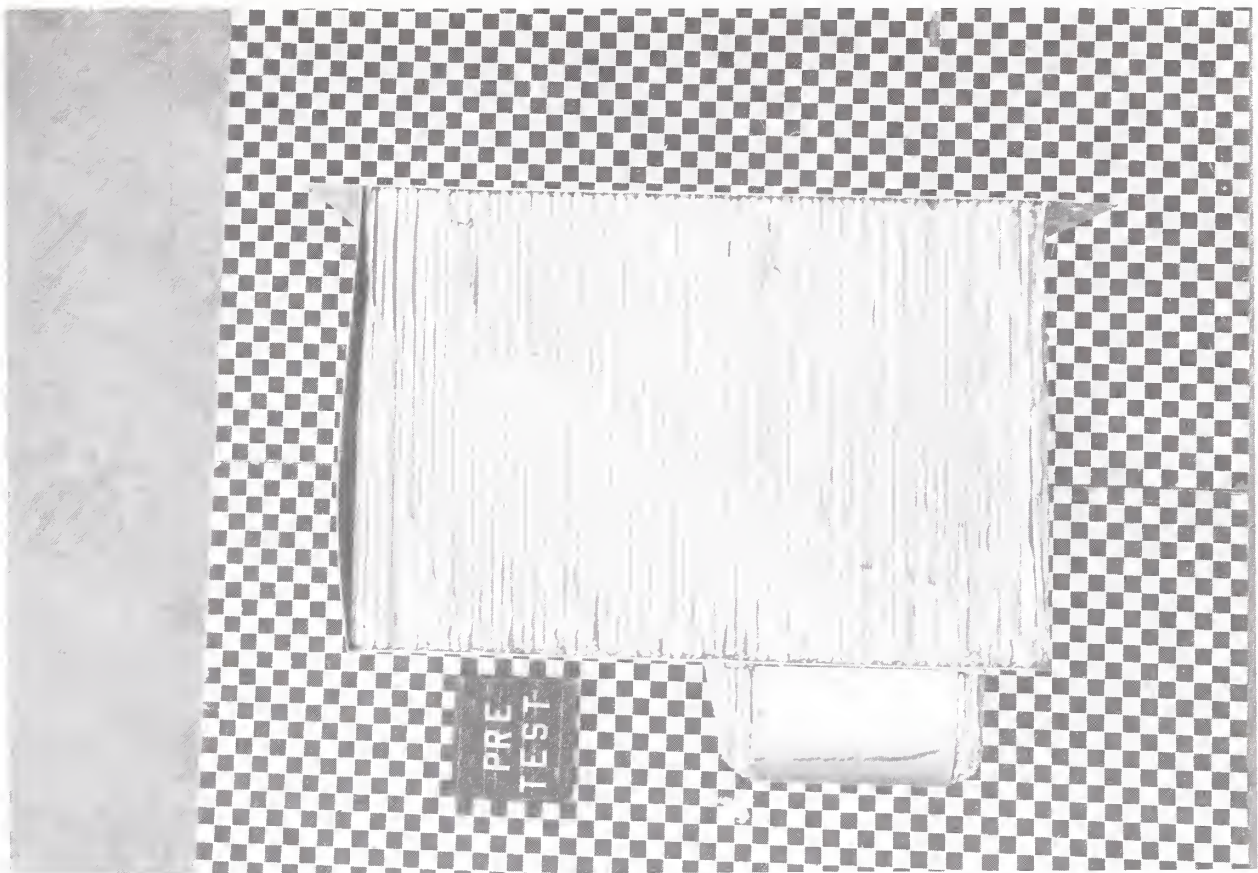


Figure A-23. PRE-TEST MDB FACE - VIEW 2

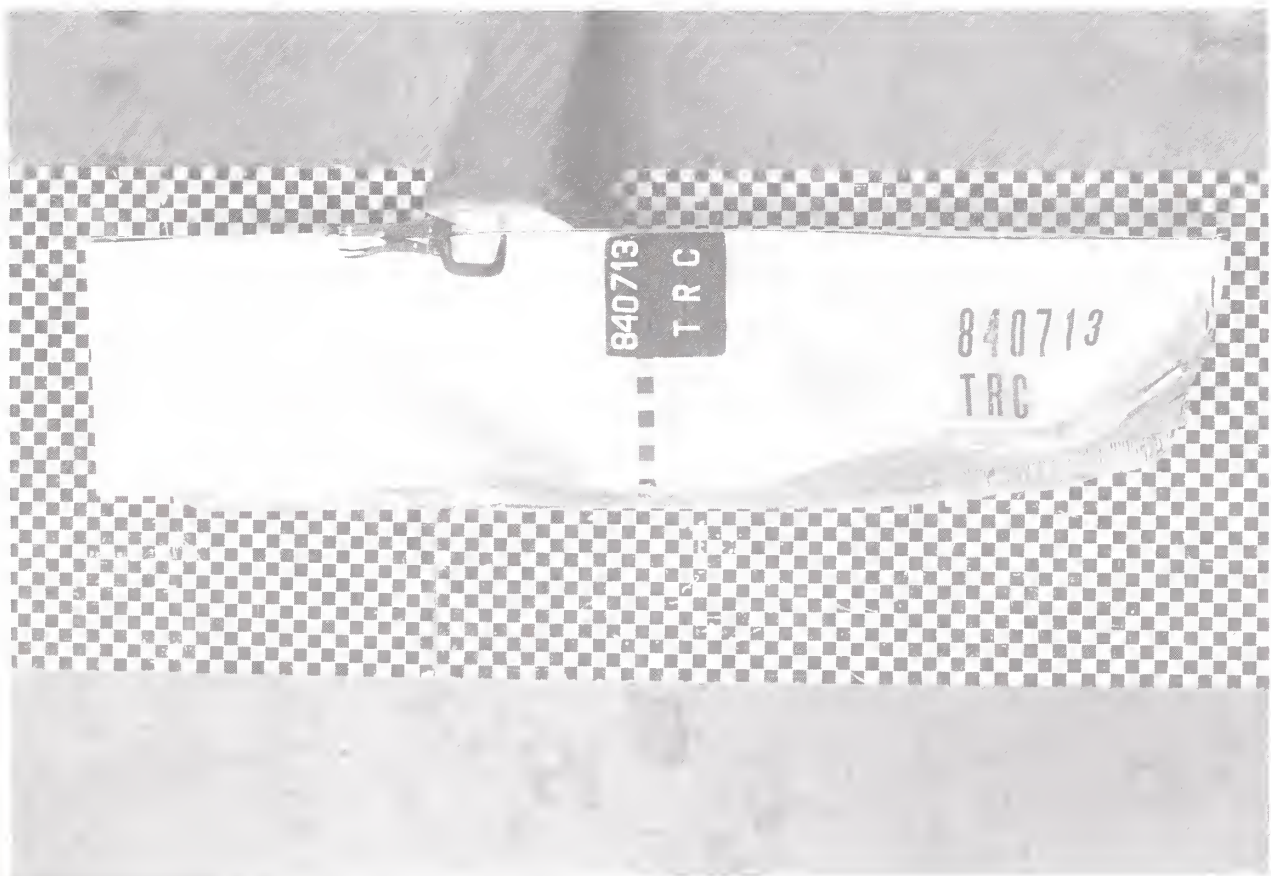


Figure A-24. POST-TEST MDB FACE - VIEW 1
A-13

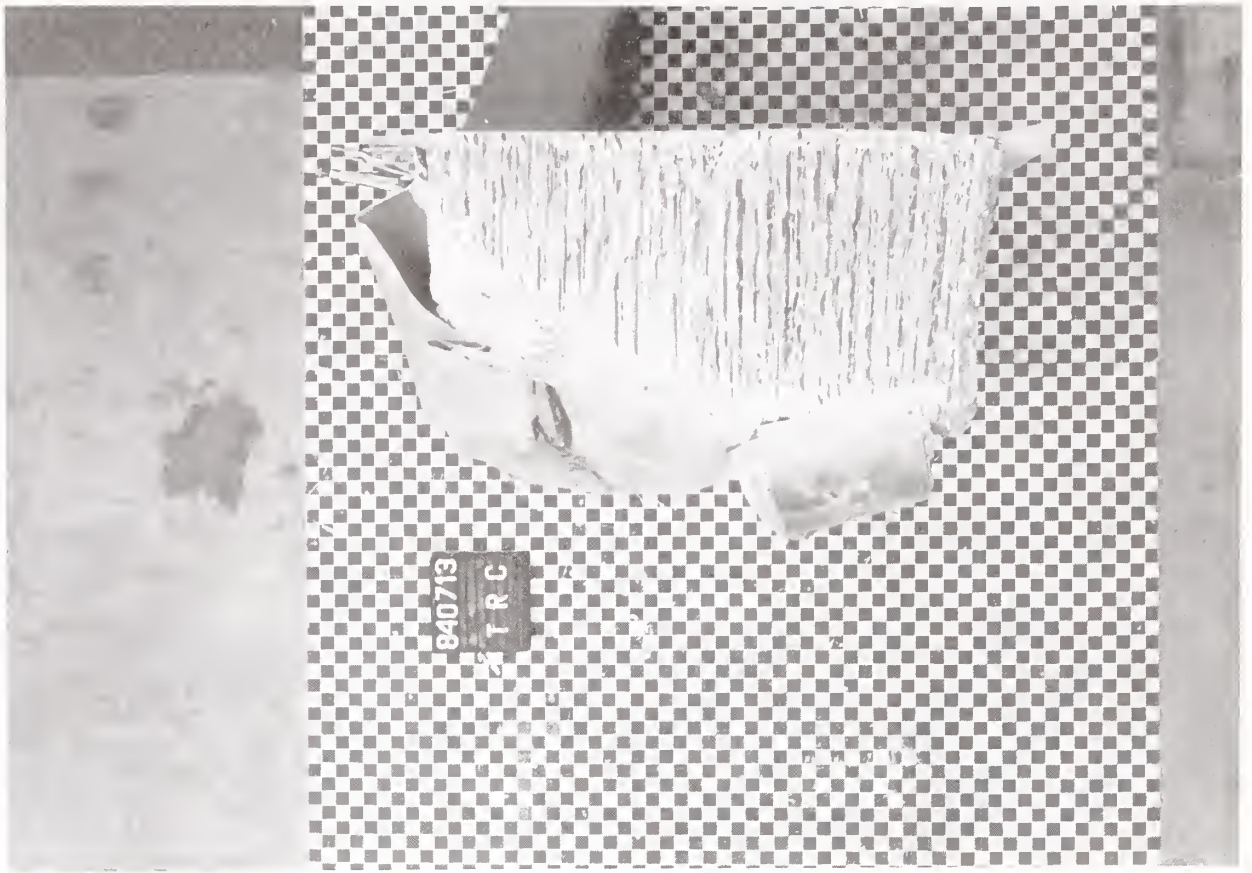


Figure A-25. POST-TEST MDB FACE - VIEW 2

APPENDIX B
DATA PLOT PRESENTATION

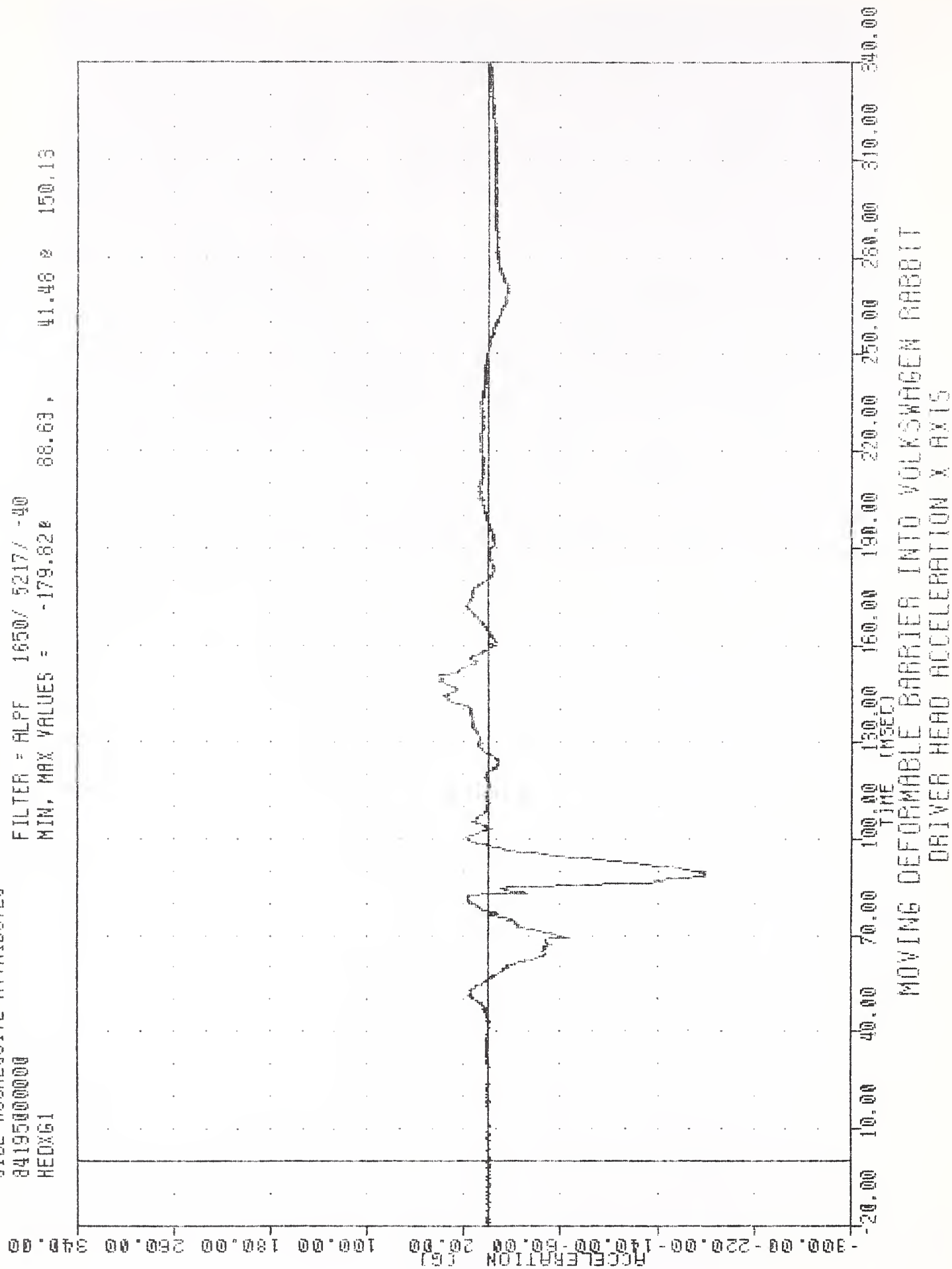
Data plots generated from the crash test data are presented on the following pages. All data are recorded on magnetic tape for inclusion in the NHTSA crash test data base system. The data was filtered according to SAE J211, except dummy thorax data which was filtered using the HSRI filter.

INC 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 HEDXG1

PLU1 DATE 13-AUG-84 14:17:03

FILTER = ALPF 1650/ 5217/ -40

MIN, MAX VALUES = -179.828 88.63, 41.48 150.13



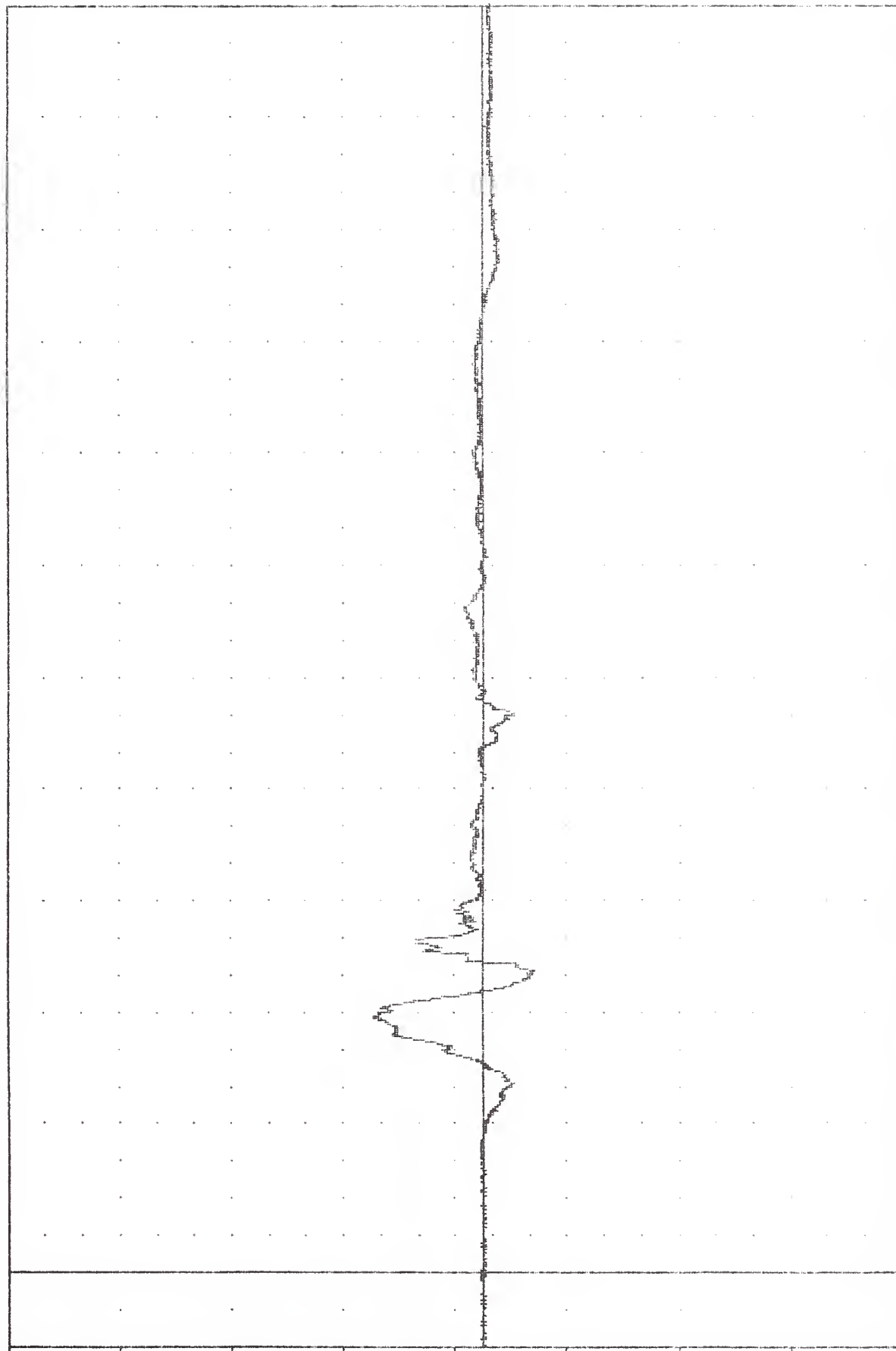
THC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 HEDYG1

PLU1 DR1E 13-MUG-84 14:17:03

FILTER = ALPF 1650/ 5217/ -40

MIN, MAX VALUES = -37.140 80.63, 78.05 @ 68.38

ACCELERATION (G)



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

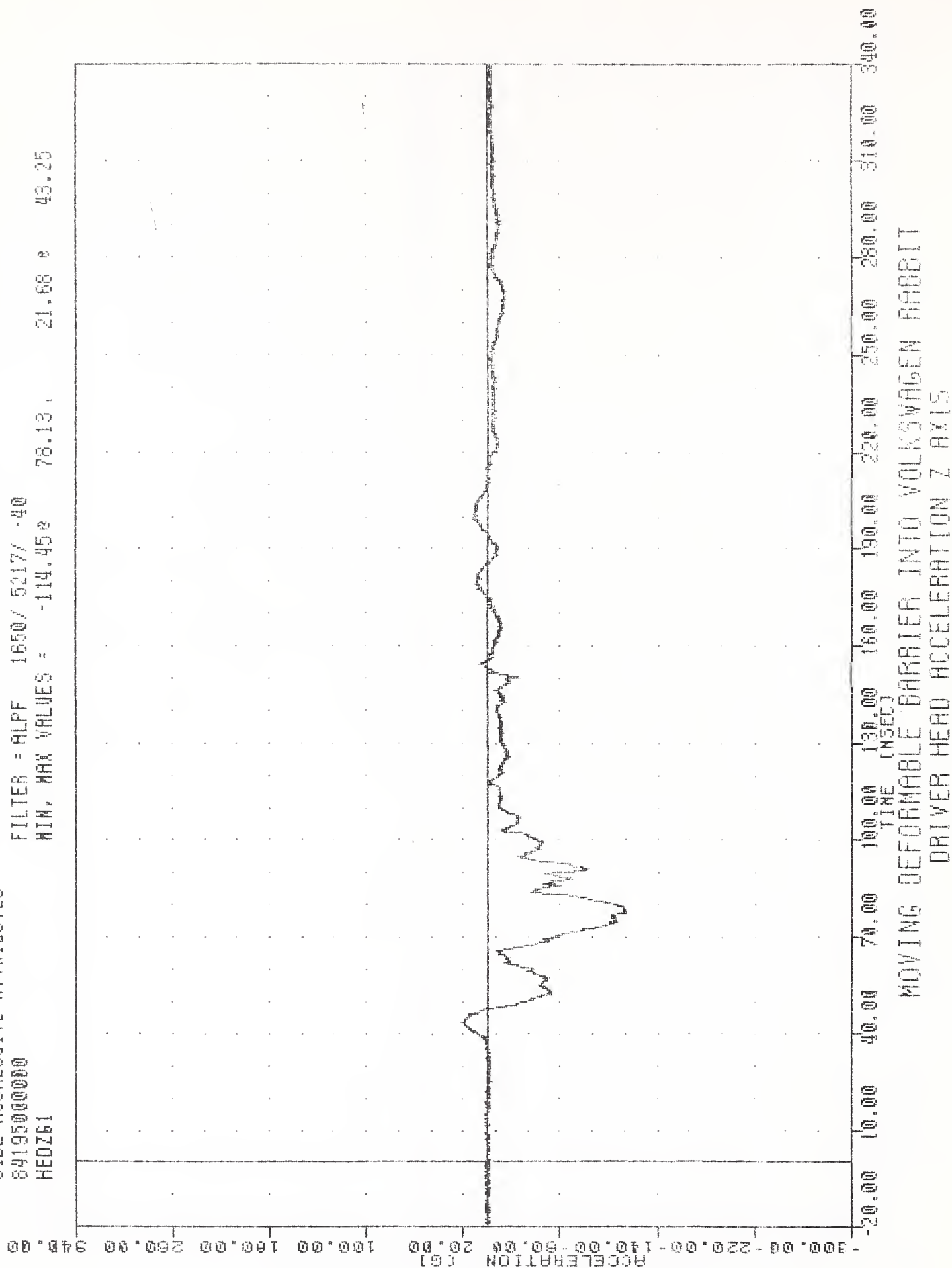
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER HEAD ACCELERATION Y AXIS

TAL 040715
 SIDE AGGRESSIVE ATTRIBUTES
 841950000000
 HEDZ61

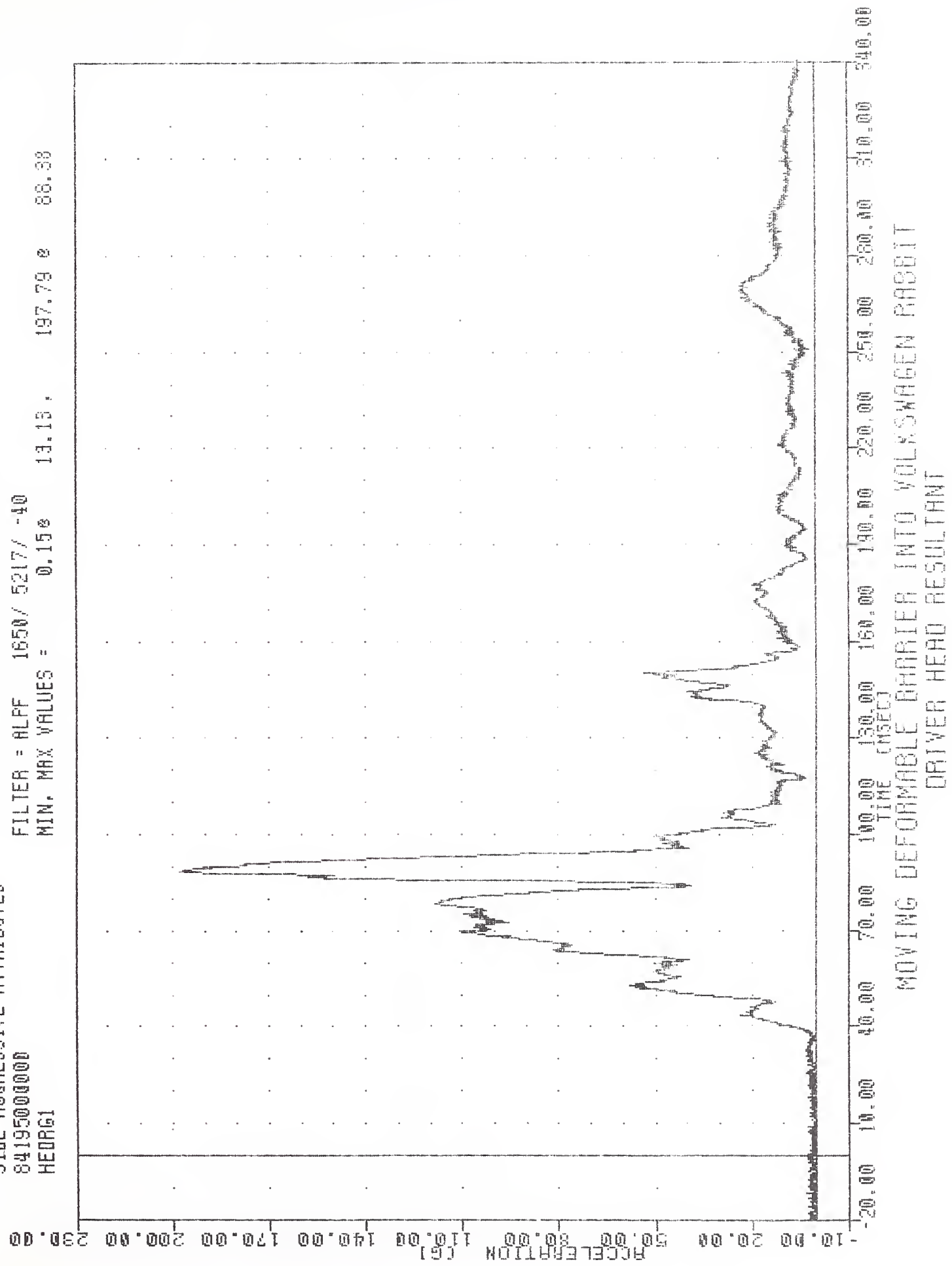
PLU1 DATE 10-MAR-04 14:17:00

FILTER = ALPF 1650/ 5217/ -40

MIN, MAX VALUES = -114.45g 78.13, 21.68 g 43.25



THC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 841950000000
 HEADG1
 FLUI DATE 13-AUG-84 14:17:05
 FILTER = ALPF 1650 / 5217 / -40
 MIN. MAX VALUES = 0.158 13.13 , 197.79 8 88.38

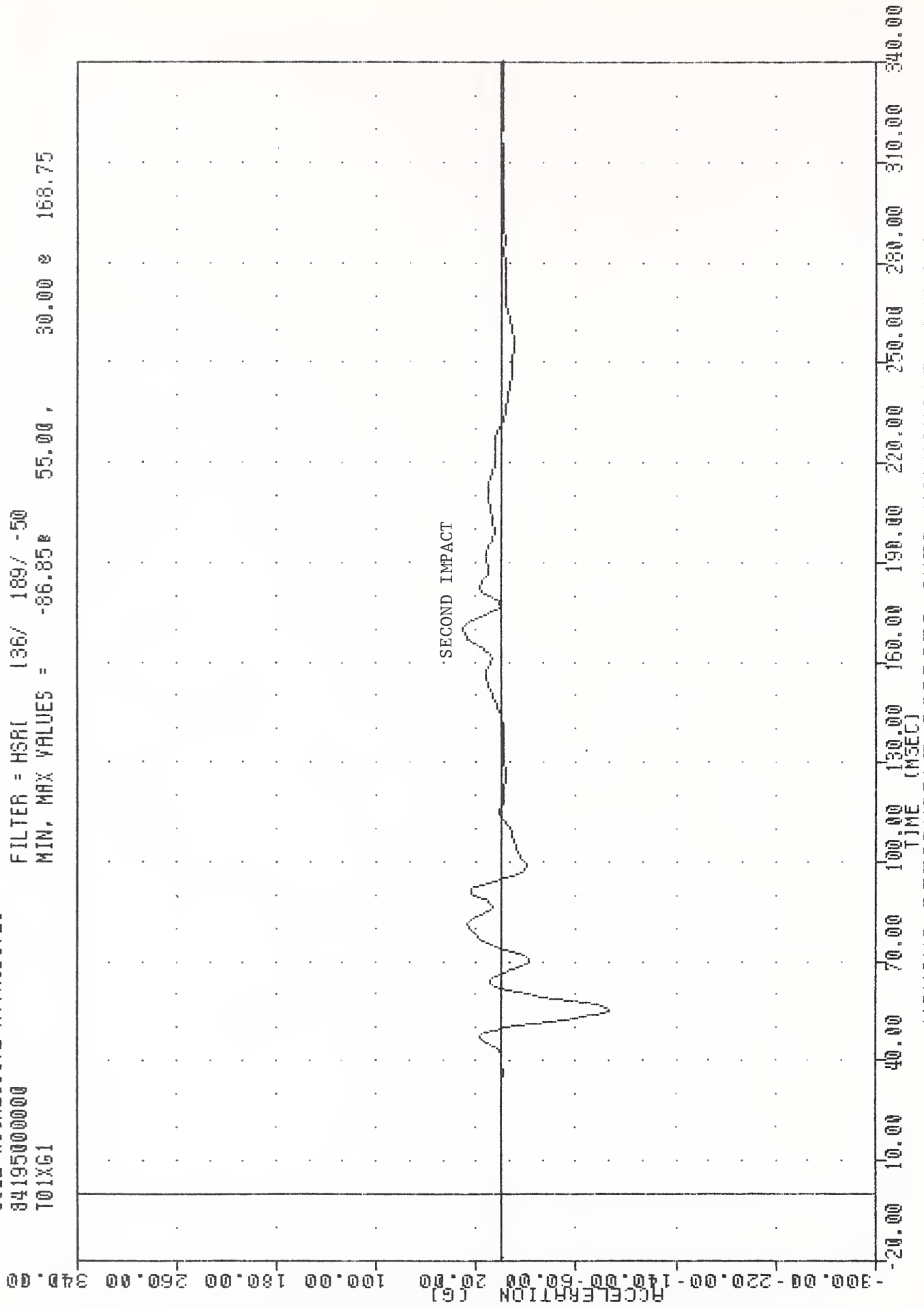


THC , 840713
SIDE AGGRESSIVE ATTRIBUTES
84195000000
T01XG1

PLU1 DATE 30-JUL-84 10:33:42

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -86.858 55.00 , 30.00 @ 168.75

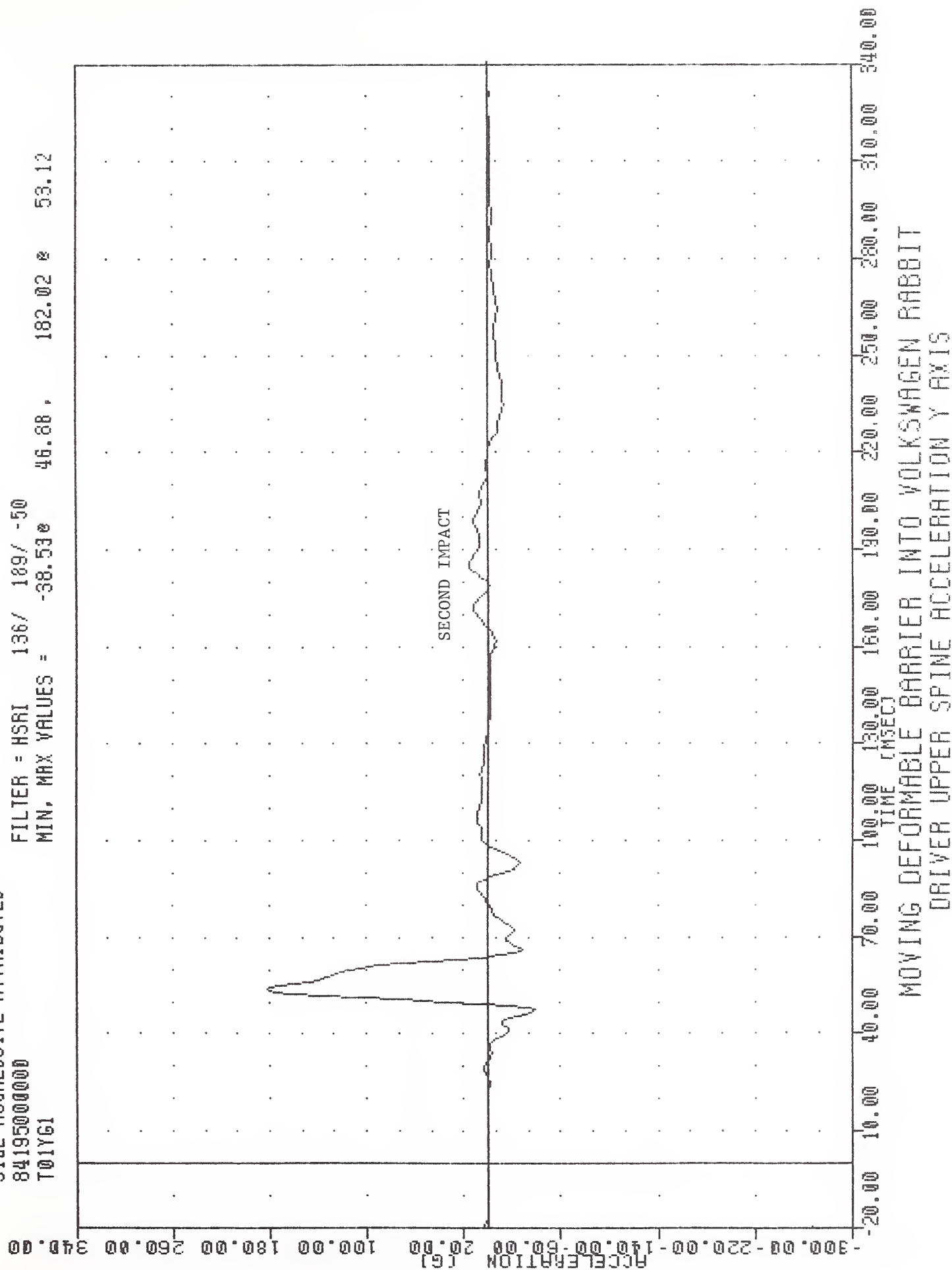


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER UPPER SPINE ACCELERATION X AXIS

TMC 840715
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 T01Y61

Plot Date 30-JUL-84 10:33:42

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -38.530 46.88, 182.02 0 53.12

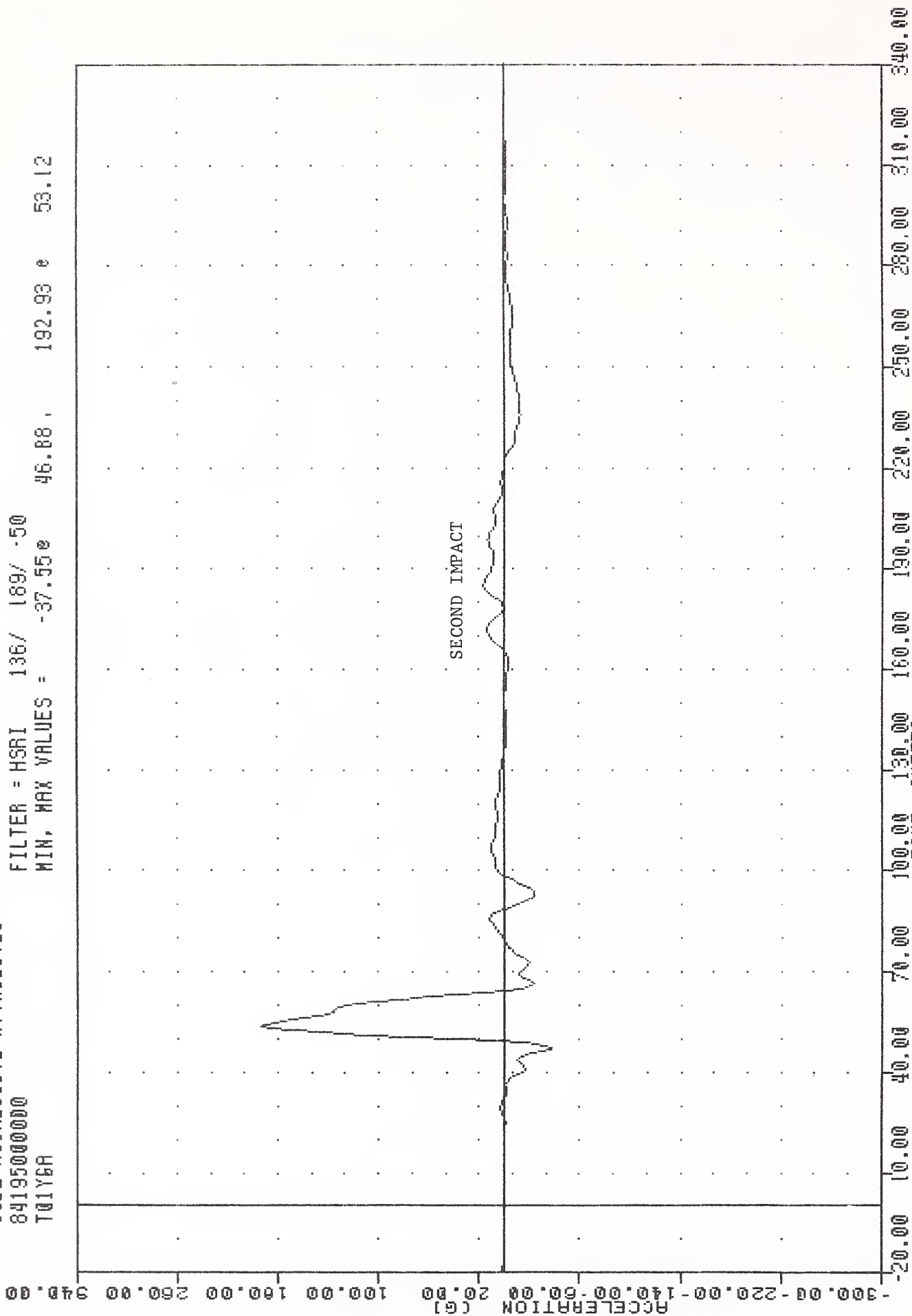


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER UPPER SPINE ACCELERATION Y AXIS

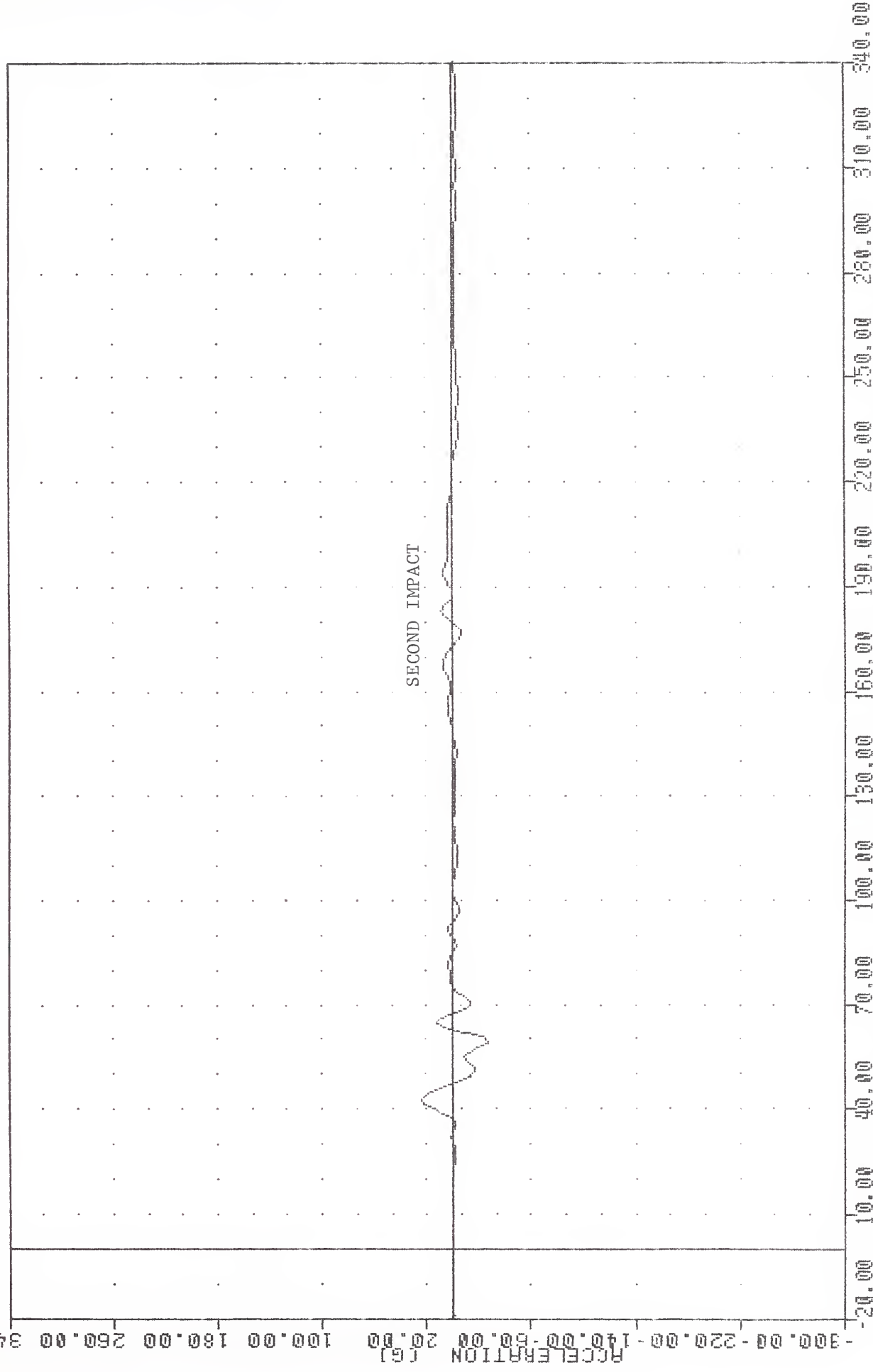
TUC 0710
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 T01Y6A

PLU1 DAIL 30 JUL 04 10:31:42

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -37.550 46.88 , 192.93 0 53.12



inv , 040710
 SIDE AGGRESSIVE ATTRIBUTES
 841950000000
 T01761
 FLUO DATE 5W-JUL-04 10:53:42
 FILTER = HSR1 136/ 189/ -50
 MIN. MAX VALUES = -26.990 58.75 , 23.25 41.87



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER UPPER SPINE ACCELERATION Z AXIS

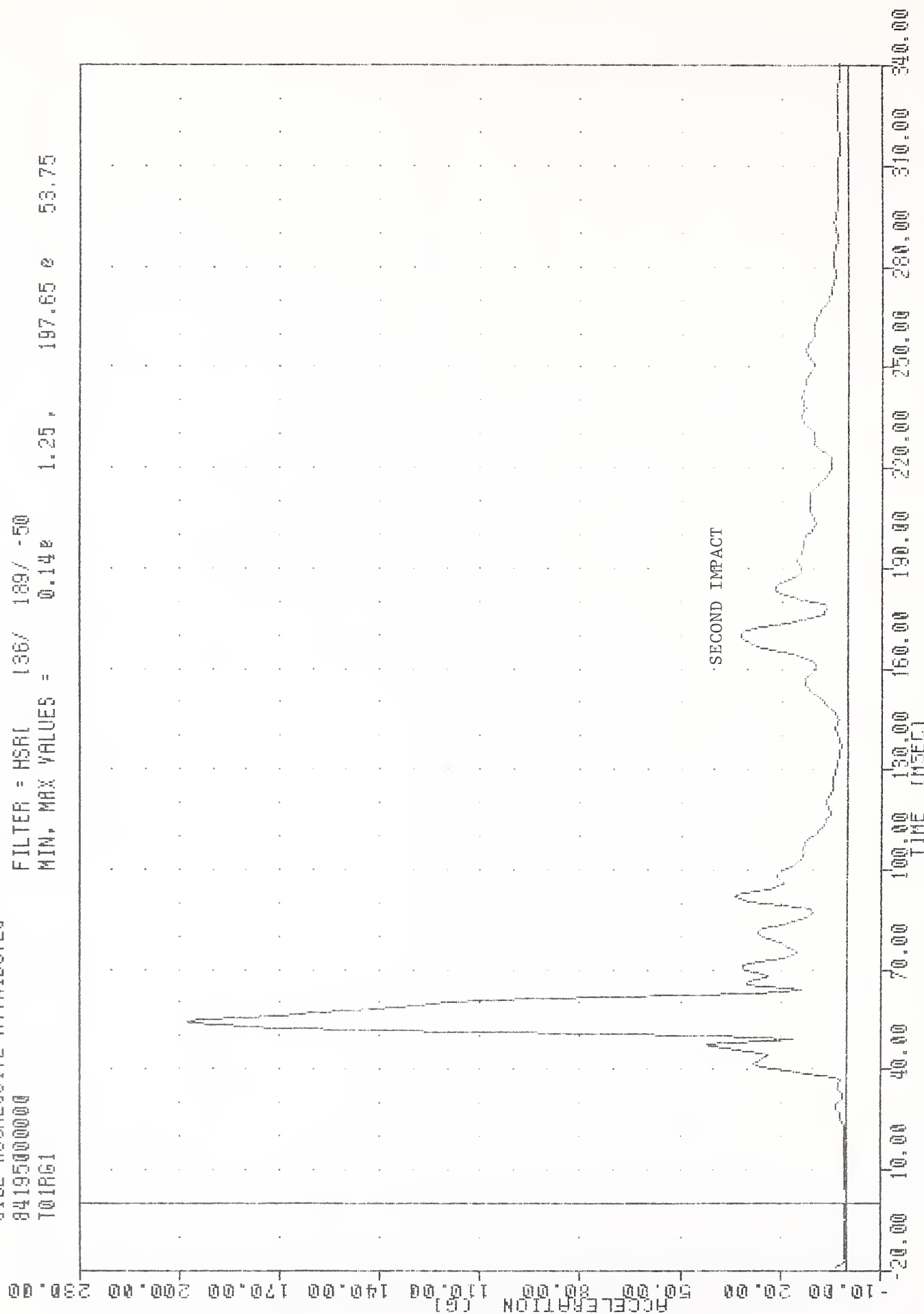
SIDE AGGRESSIVE ATTRIBUTES

84195000000

701R61

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = 0.140 1.25, 197.65 0 53.75



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER UPPER SPINE RESULTANT

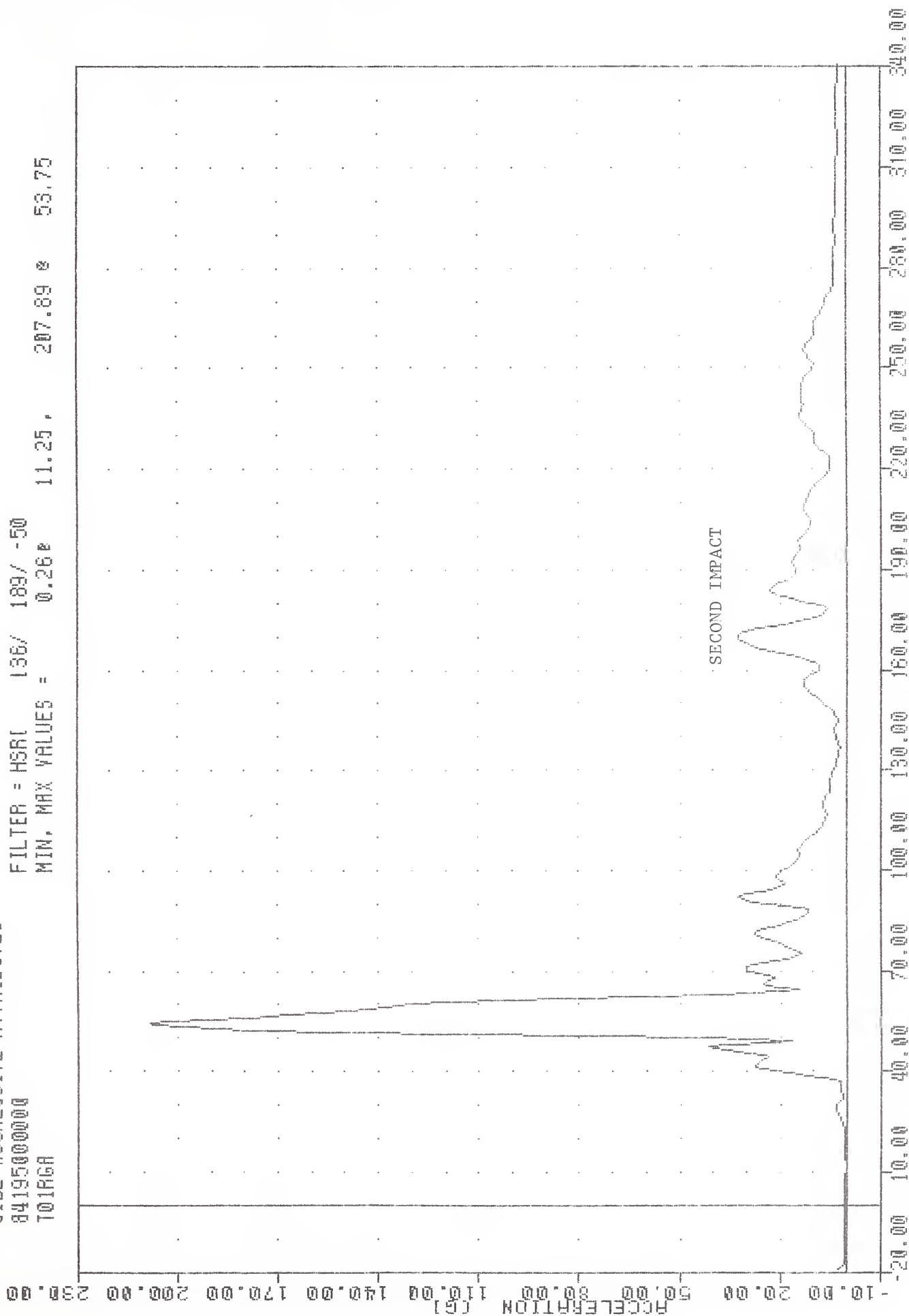
SIDE AGGRESSIVE ATTRIBUTES

84195000000

T01RGA

FILTER = HSRL 136/ 189/ -50

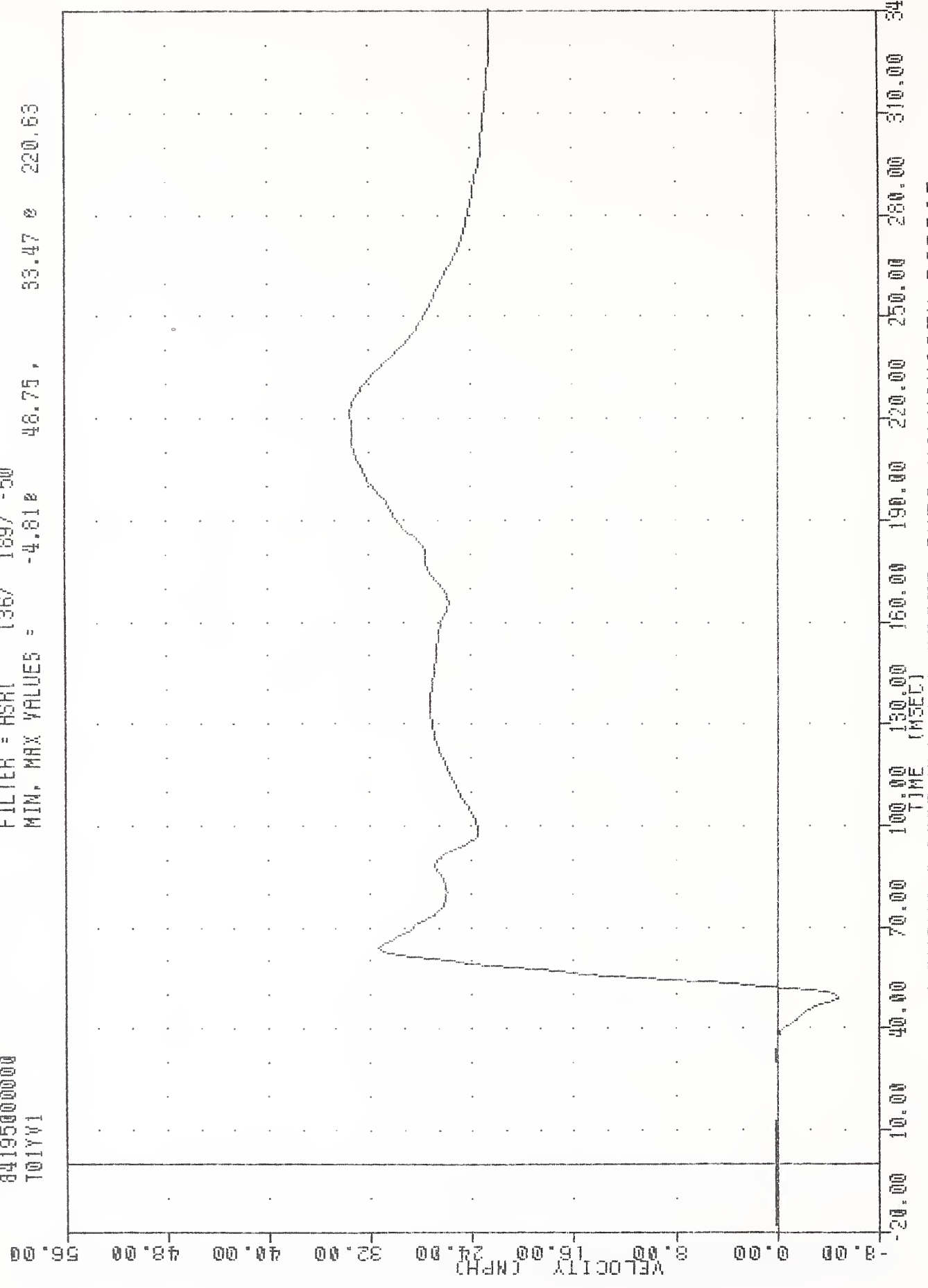
MIN. MAX VALUES = 0.26 11.25, 207.89 53.75



FILE NAME: 60 JUL 80 10:12:00

TIME: 07:00
SIDE AGGRESSIVE ATTRIBUTES
84195000000
T01YV1

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -4.810 48.75, 33.47 220.63



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING T01YV1

SIDE AGGRESSIVE ATTRIBUTES

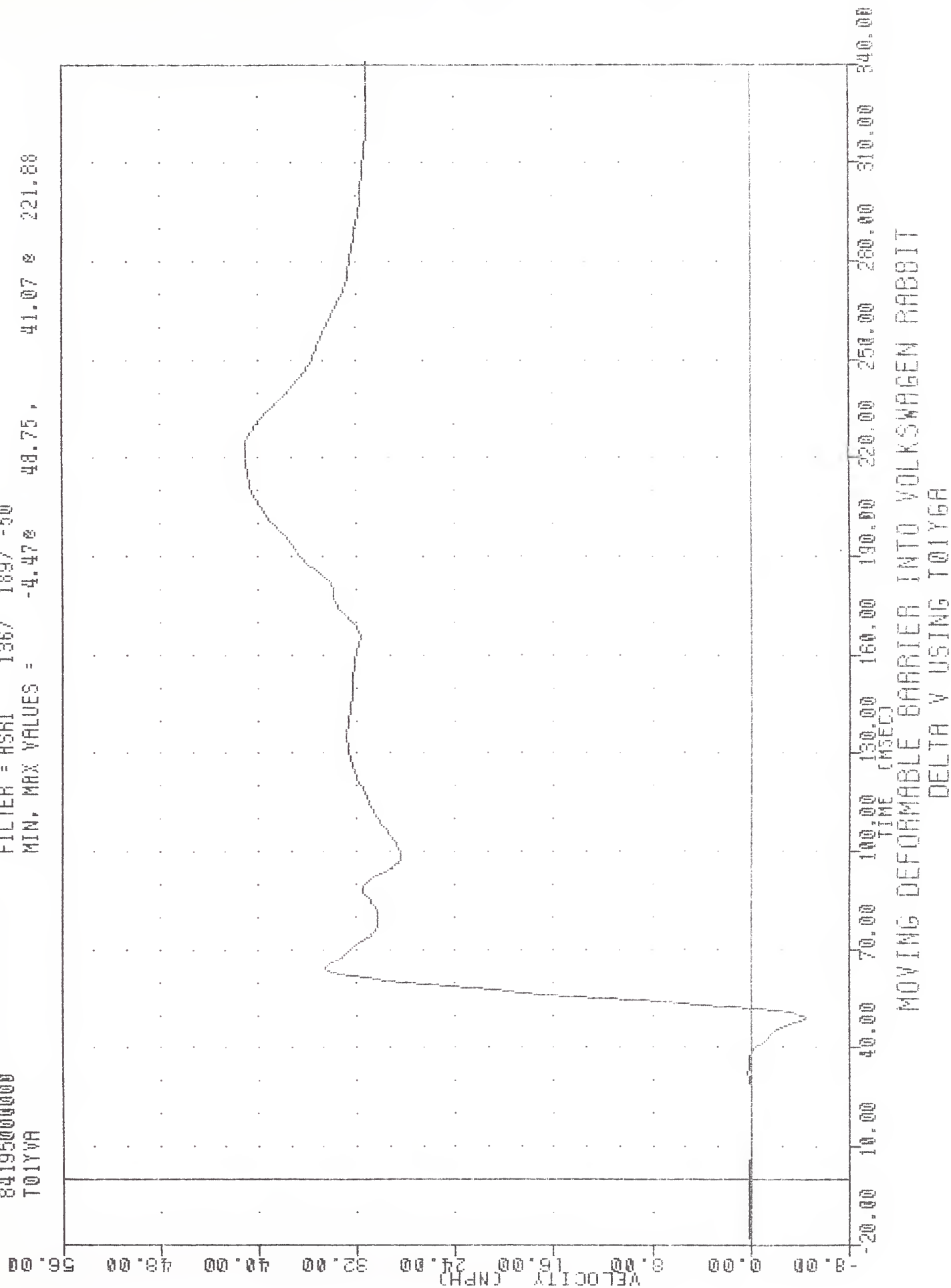
841950000000

T01YVA

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -4.47°

48.75, 41.07 ° 221.88

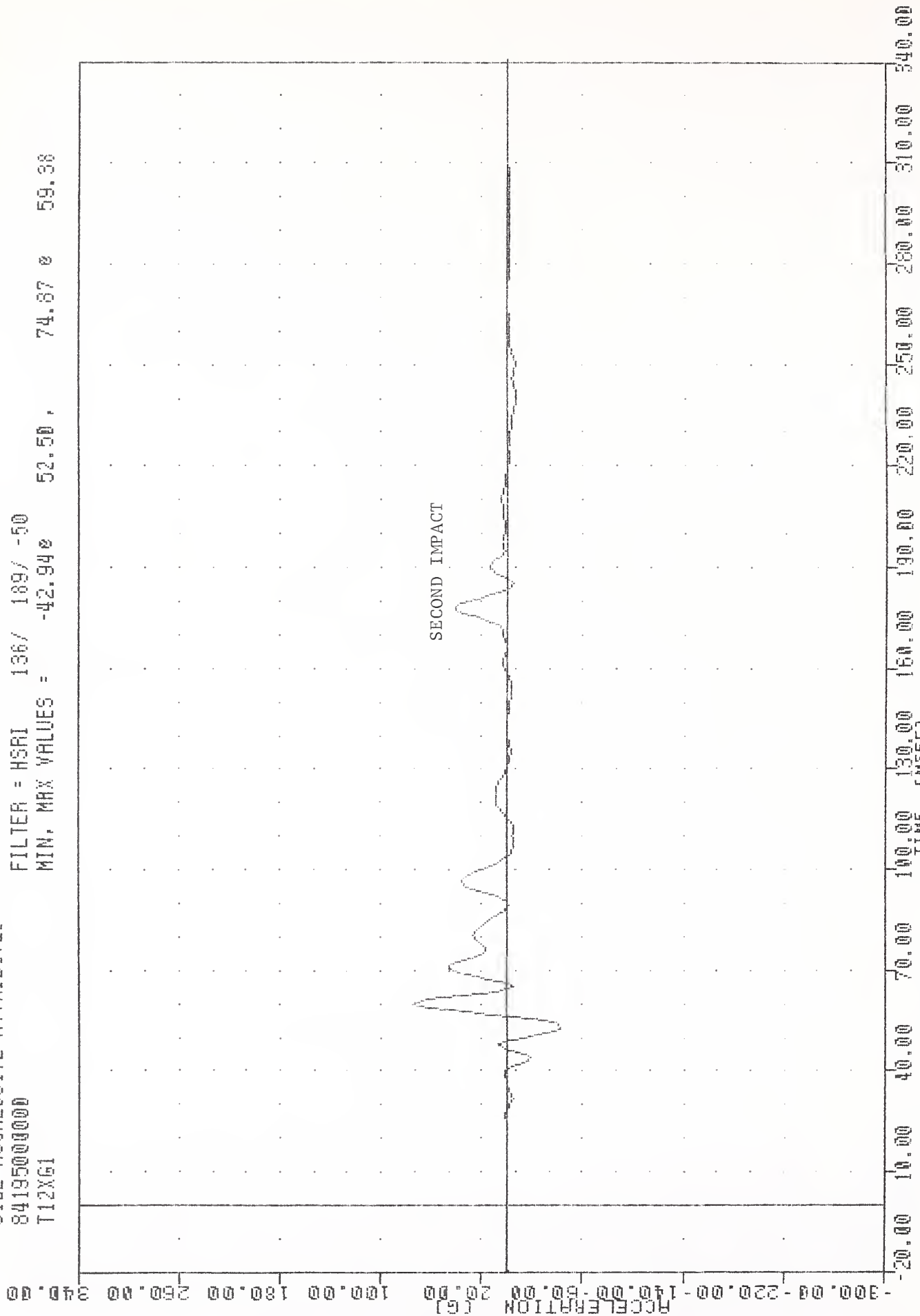


THL , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 T12XG1

FLU1 DATE 30-JUL-84 10:33:42

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -42.940 52.50, 74.87 0 59.38

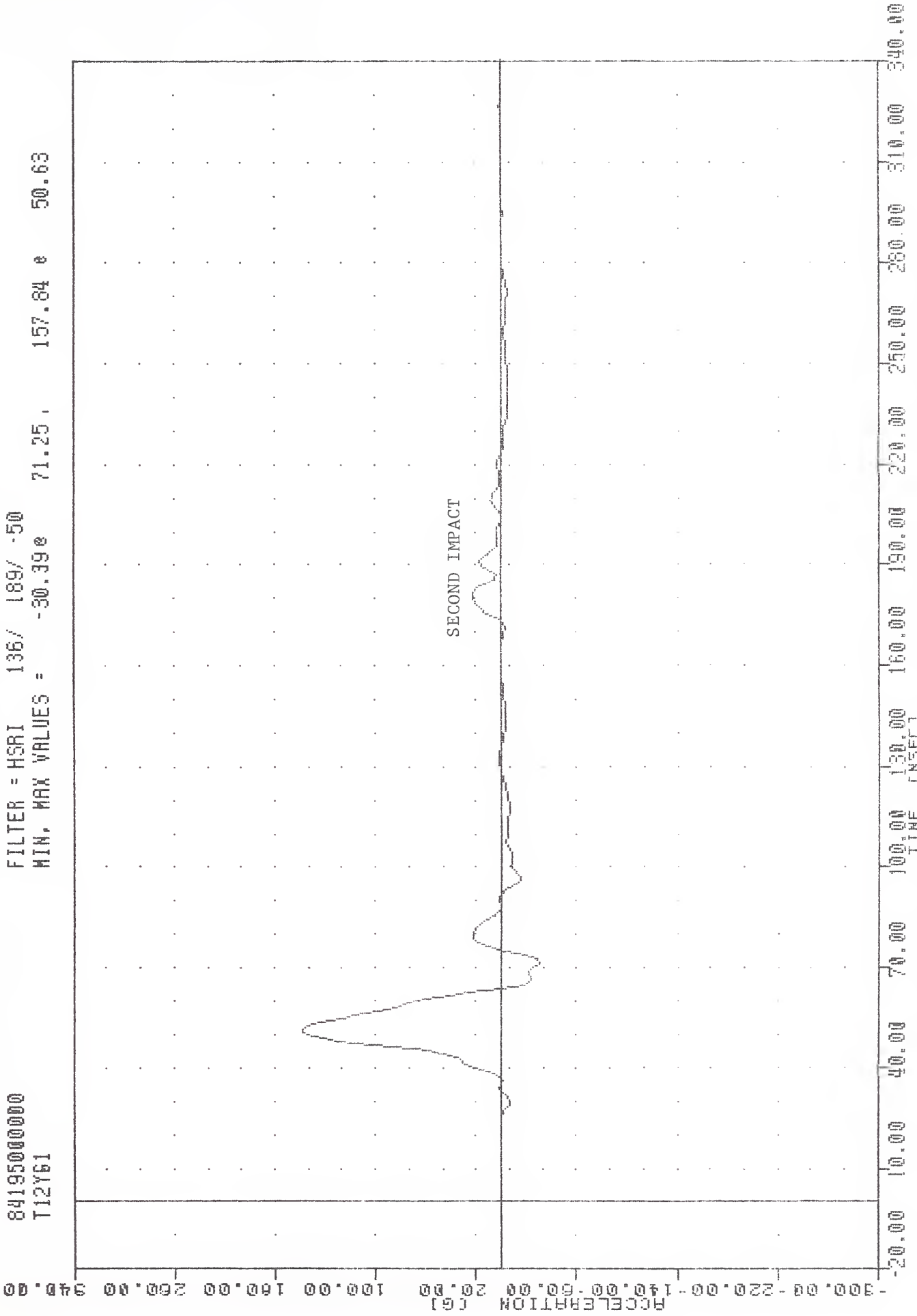


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER LOWER SPINE ACCELERATION X AXIS

INC 040/13
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 T12Y61

FLU1 UM1E 30-JUL-04 10:33:42

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -30.390 71.25, 157.84 0 50.63



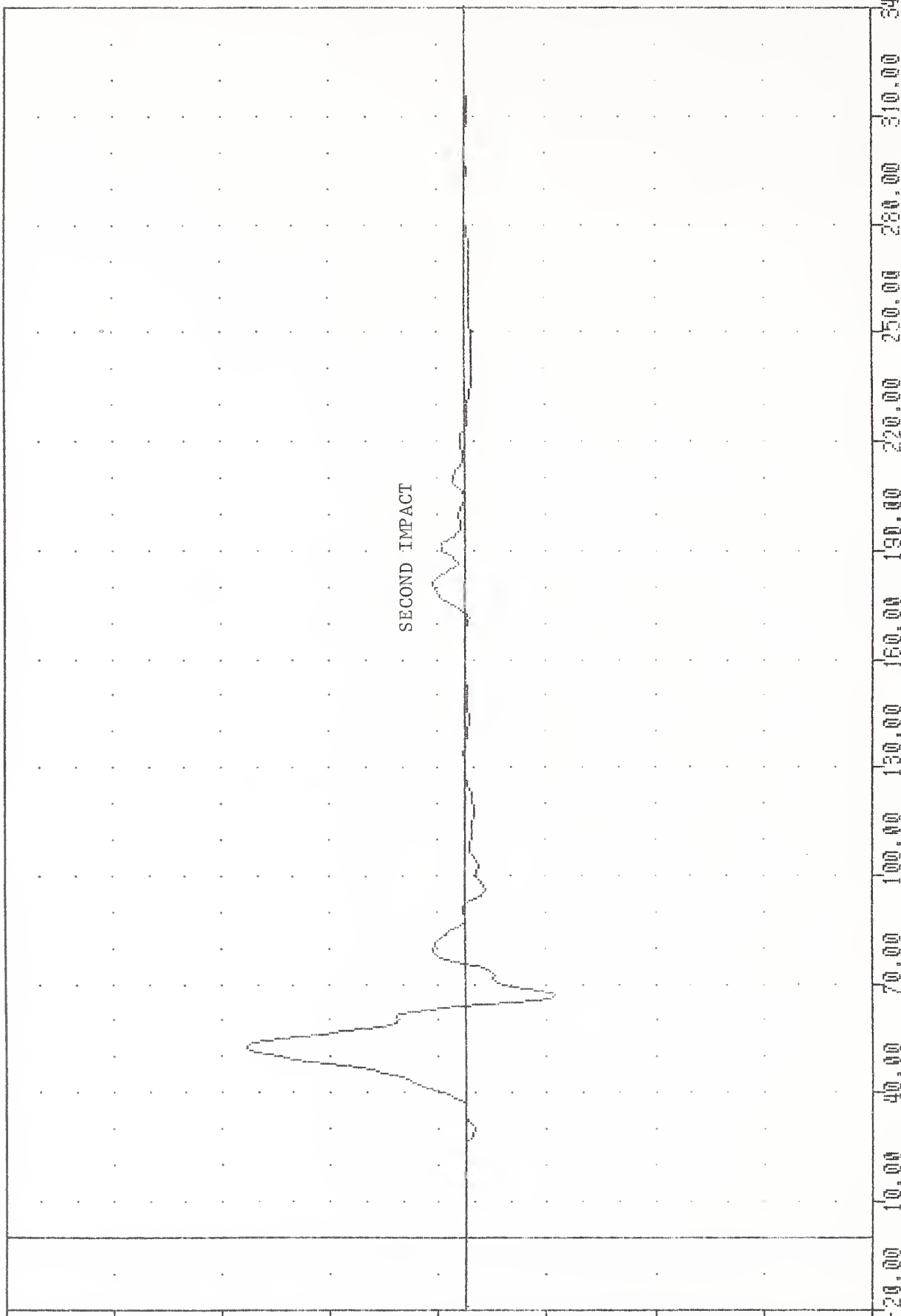
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER LOWER SPINE ACCELERATION Y AXIS

IML 84W/10
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 712YGR

FLU1 UHTE 30-JUL-84 10:33:42

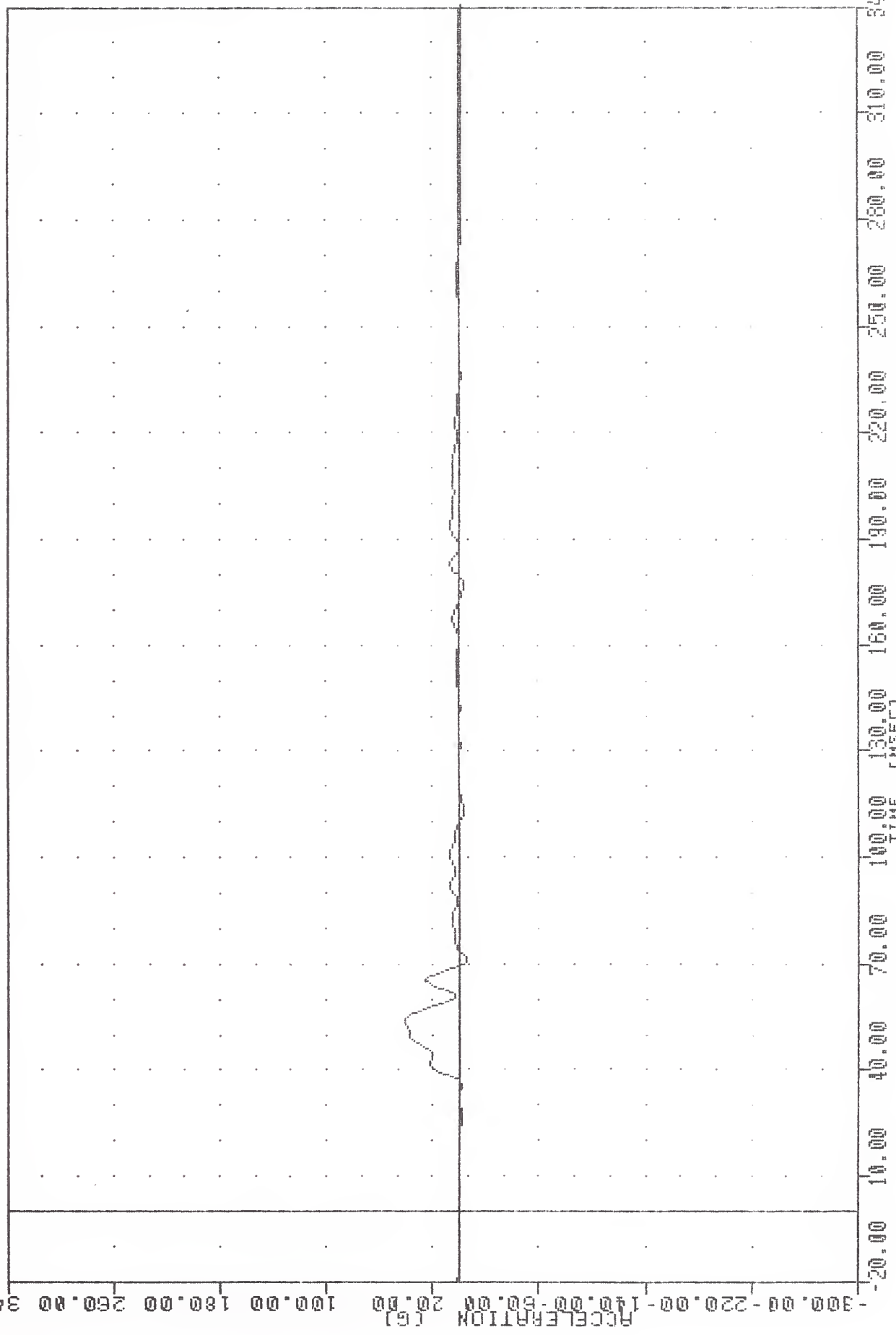
FILTER = HSR1 136/ 189/ -50
 MIN. MAX VALUES = -65.430 66.25 161.13 51.88

ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER LOWER SPINE ACCELERATION #2 Y AXIS

INL 84W/13
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 T12ZG1
 FLUT DATE 30-JUL-84 10:33:42
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -5.34e 70.63, 40.77 e 53.12

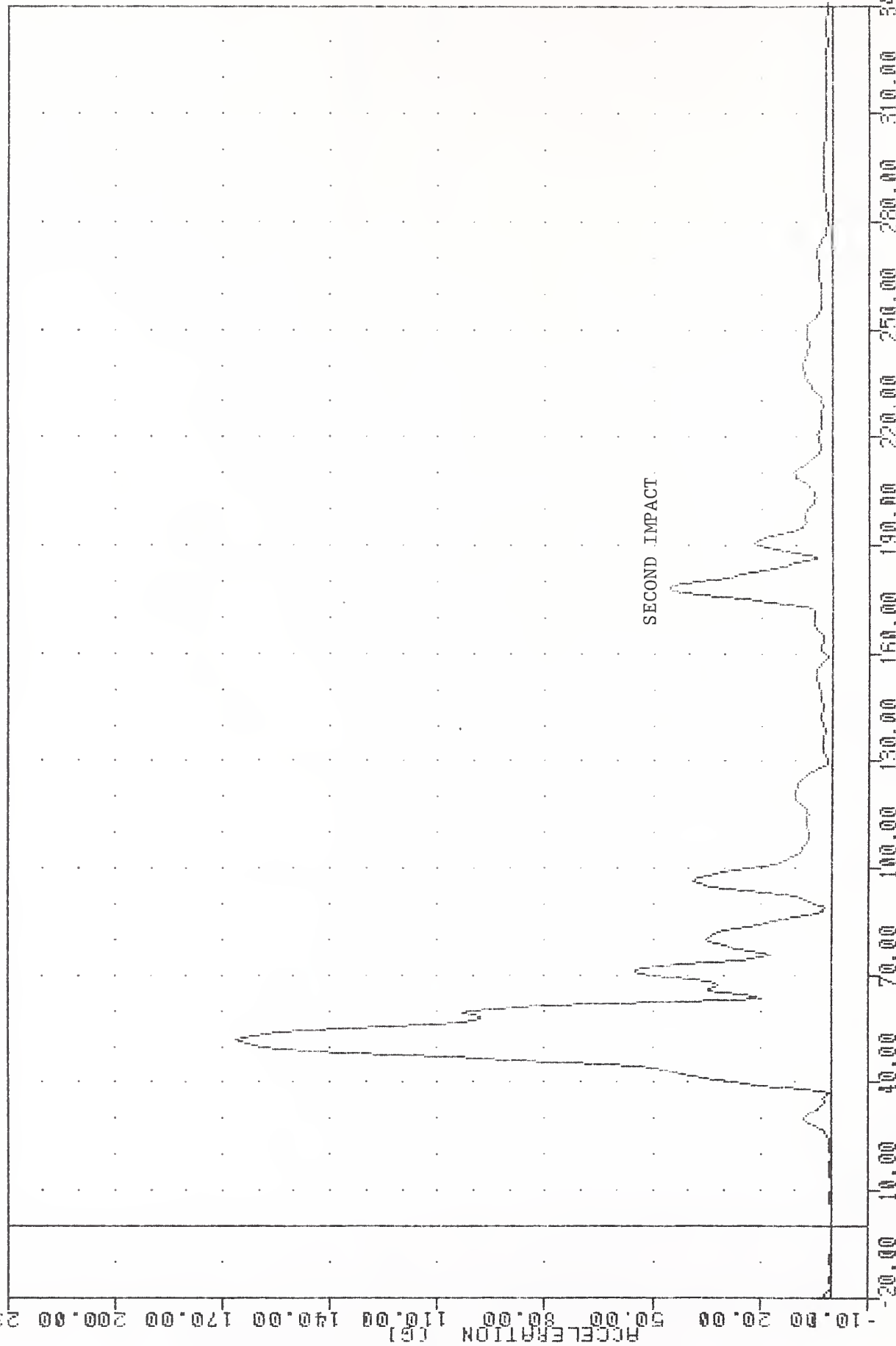


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER LOWER SPINE ACCELERATION Z AXIS

TRC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 T12RG1

PLUT DATE 30-JUL-84 11:31:22
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = 0.100 0.63, 165.87 51.25

ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER LOWER SPINE RESULTANT

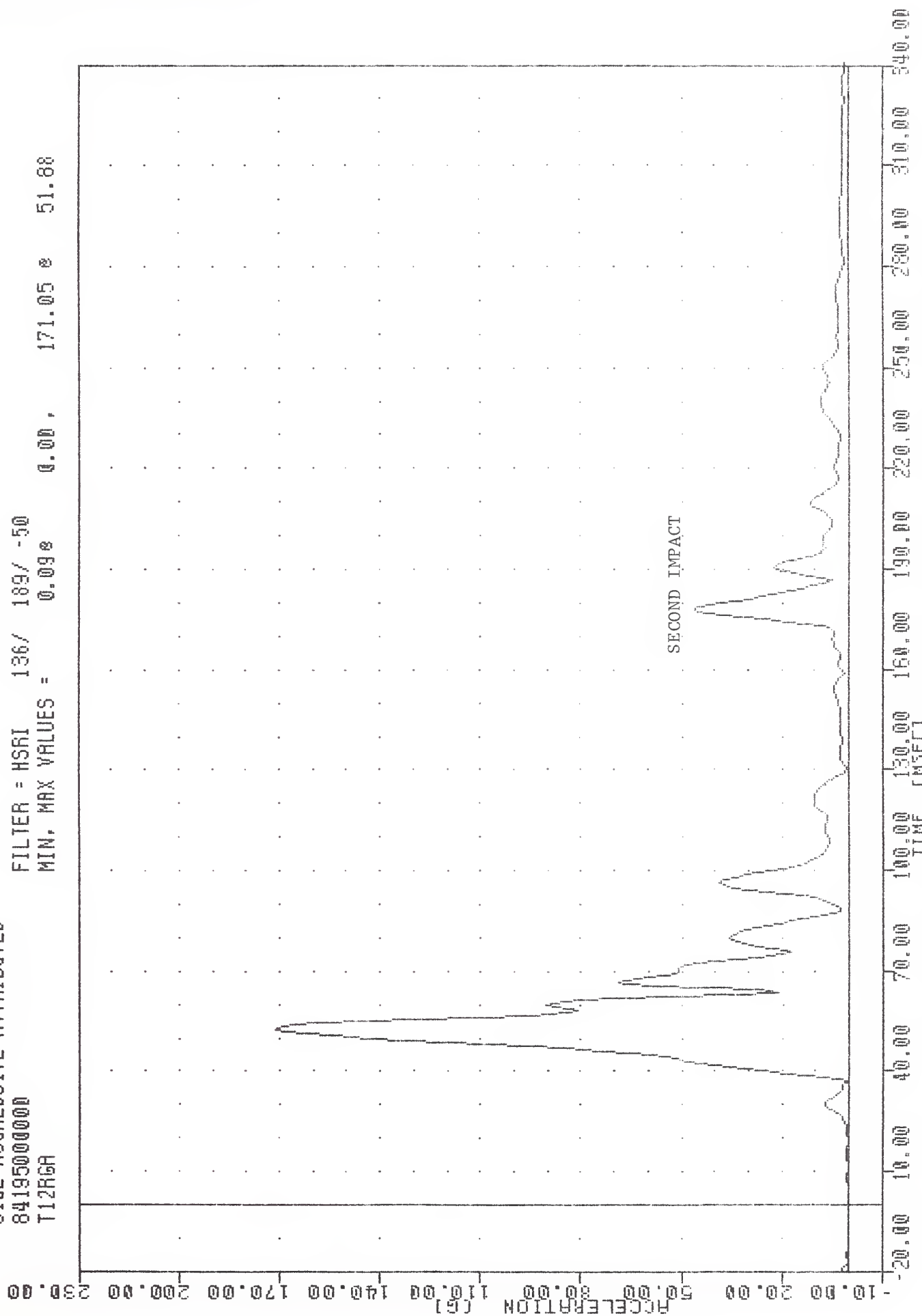
SIDE AGGRESSIVE ATTRIBUTES

84195000000

T12R6A

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = 0.098 0.00, 171.05 51.88



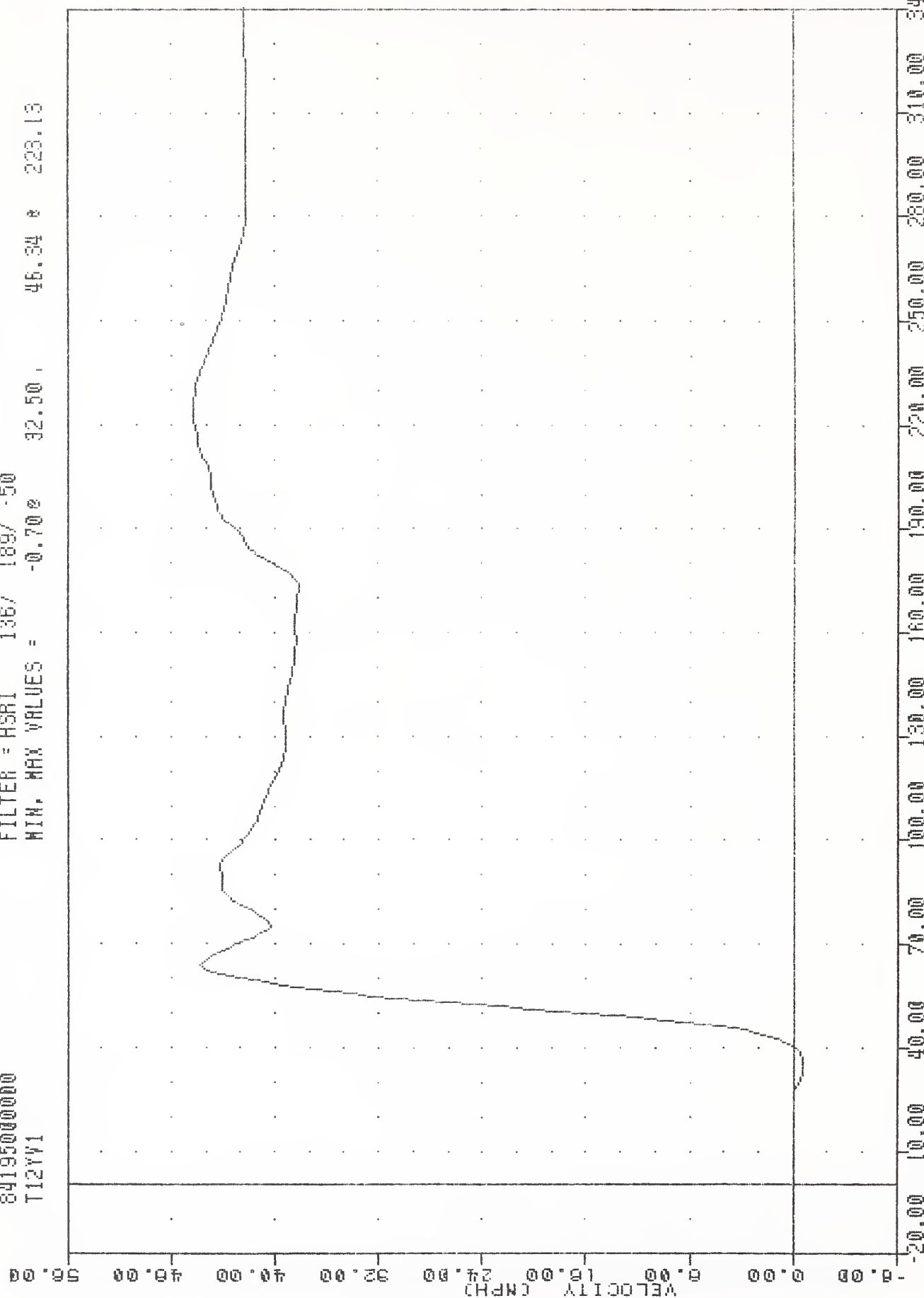
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LOWER SPINE RESULTANT USING T12Y6A

THC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 T12YV1

PLOT DATE 30-JUL-84 10:42:17

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -0.700 32.50 , 46.34 * 223.13



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T12YGI

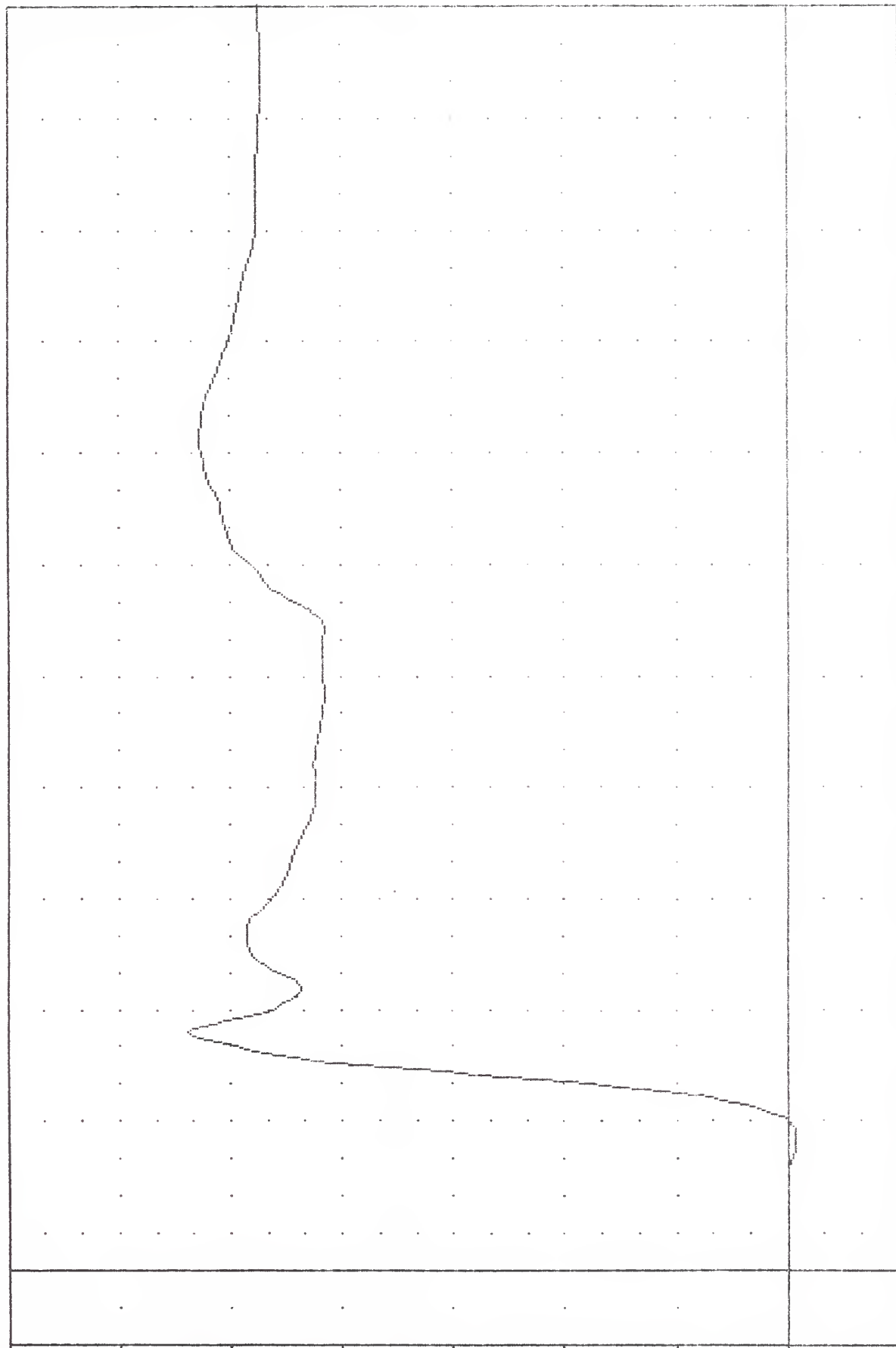
INL , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 T12YVA

PLU1 UN1E 30-JUL-84 10:42:17

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -0.570 32.50, 42.97 0 63.13

VELOCITY (MPH)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T12YGA

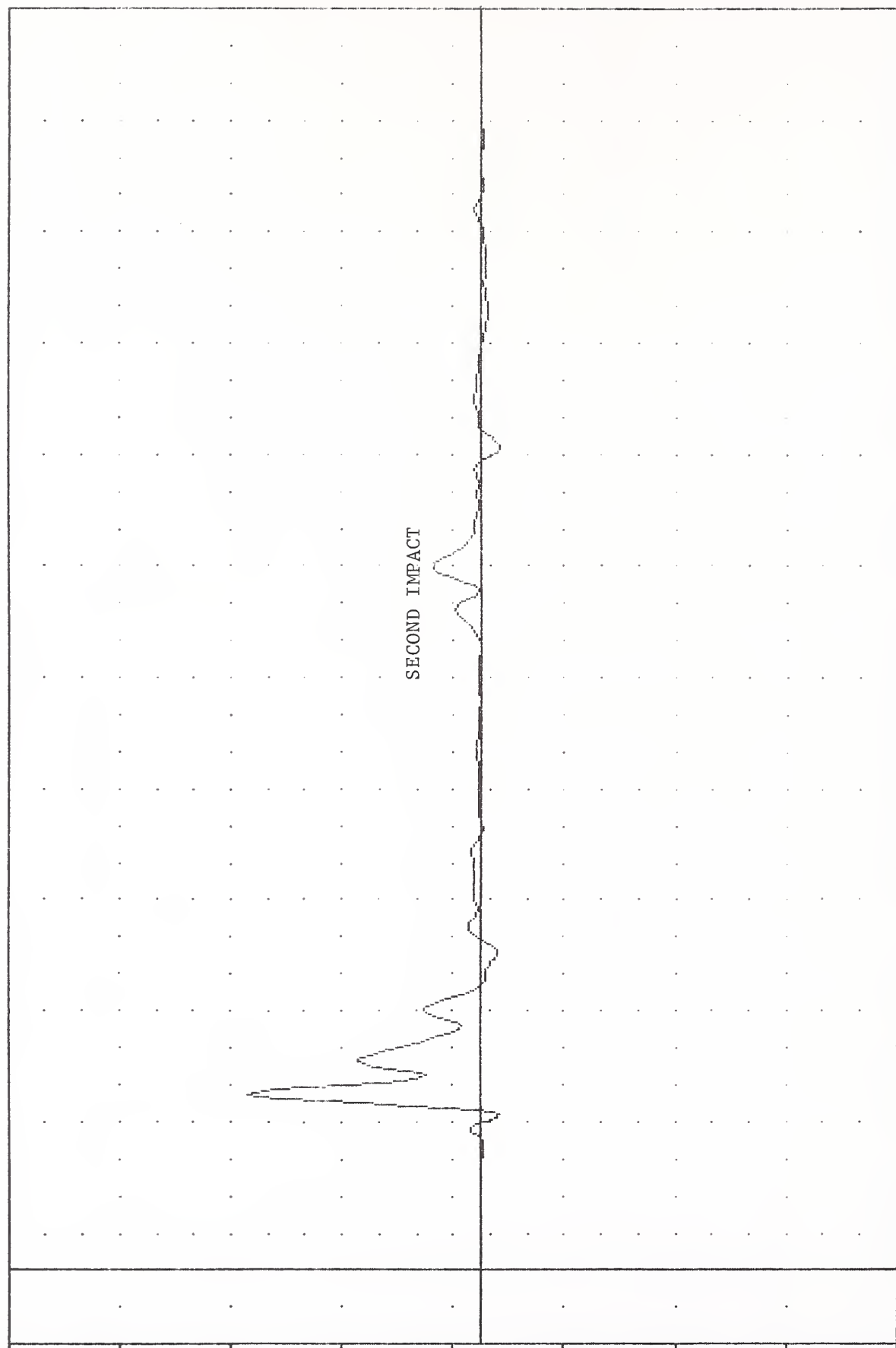
IHC , 840/13
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 LURY61

PLU1 DATE 30-JUL-84 10:55:42

FILTER = HSRI 136/ 189/ -50

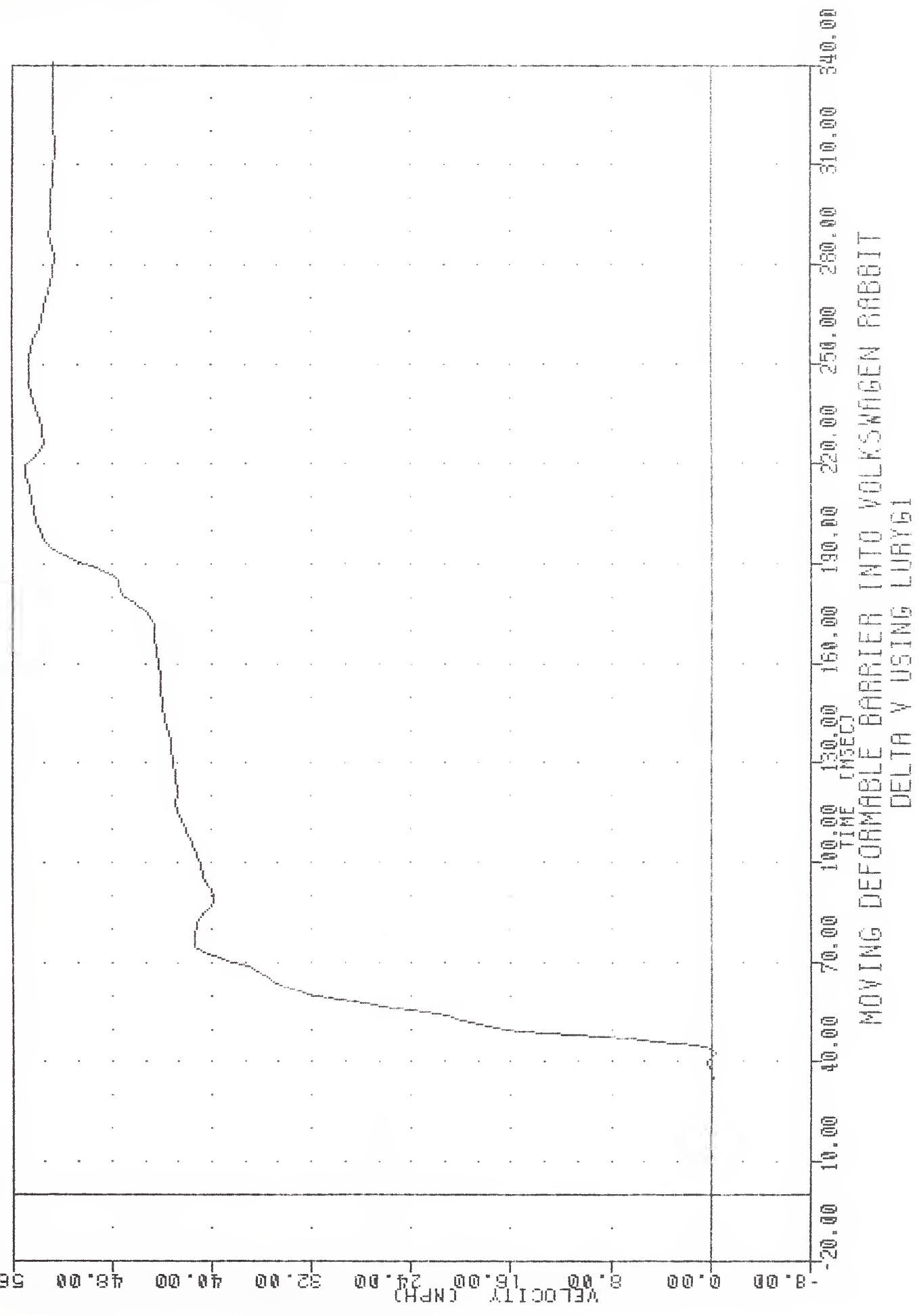
MIN, MAX VALUES = -13.908 221.25 , 167.70 & 46.88

ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER LEFT UPPER RIB ACCELERATION Y AXIS

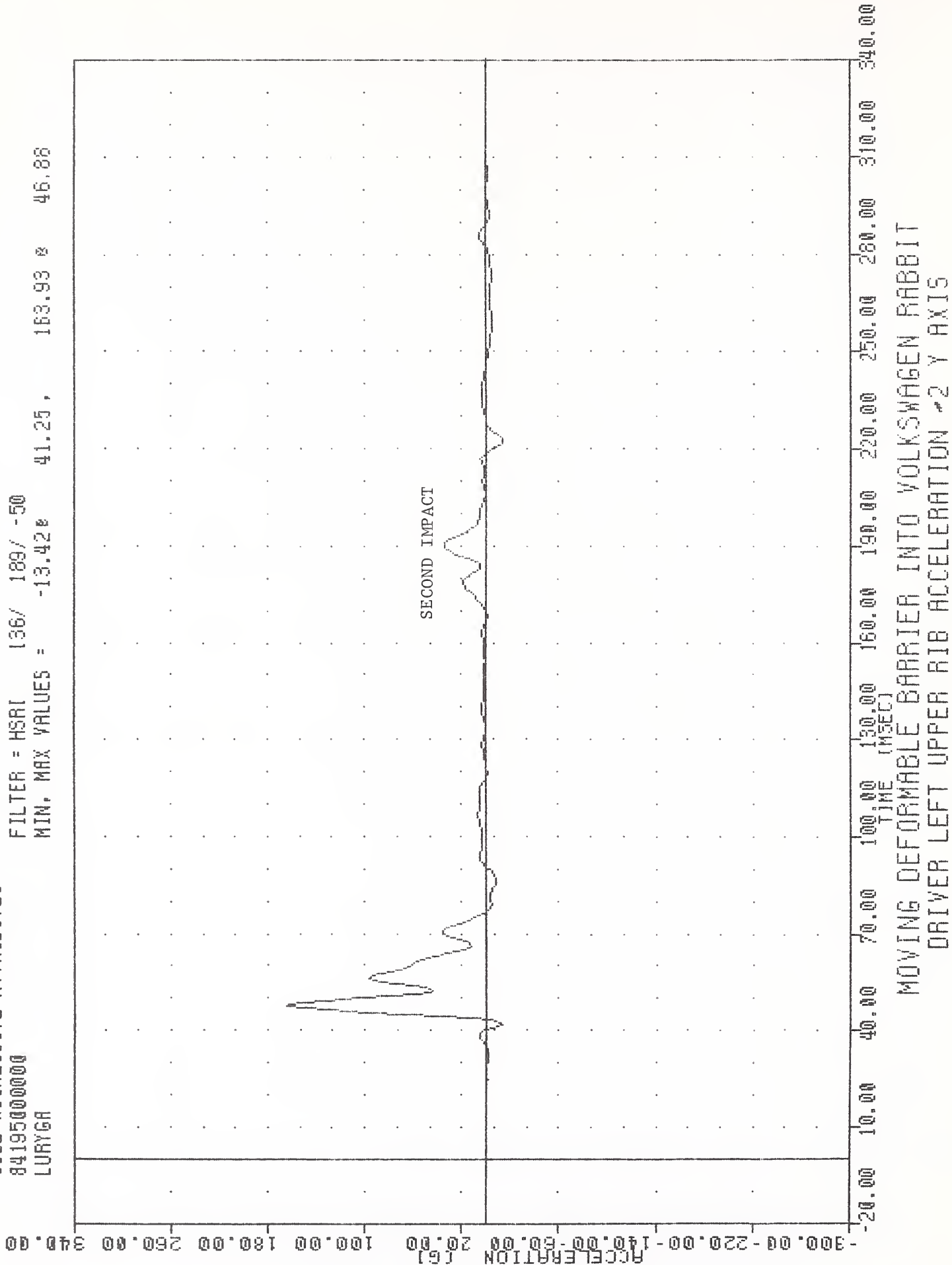
TRC 840713 PLOT DATE 30-JUL-84 TIME 12:17
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 LURYV1
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -0.340 42.50, 54.97 @ 217.50



IRL 84W/13
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 LURYGA

FLUJ UNIC 00700L 04 10.00:42

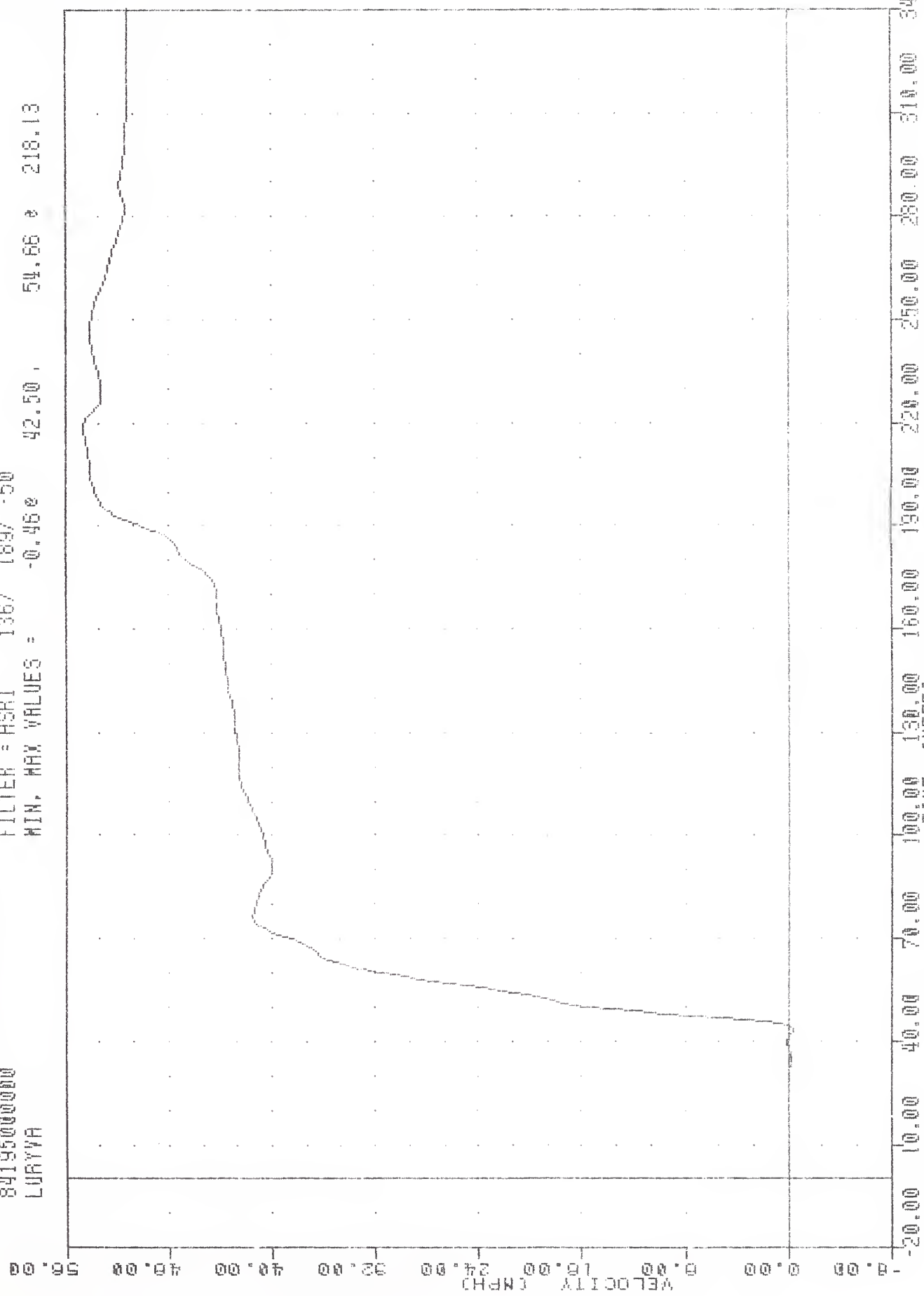
FILTER = HSR1 136/ 189/ -50
 MIN. MAX VALUES = -13.42 41.25, 153.93 46.88



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER LEFT UPPER RIB ACCELERATION #2 Y AXIS

TAC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 LURYVA

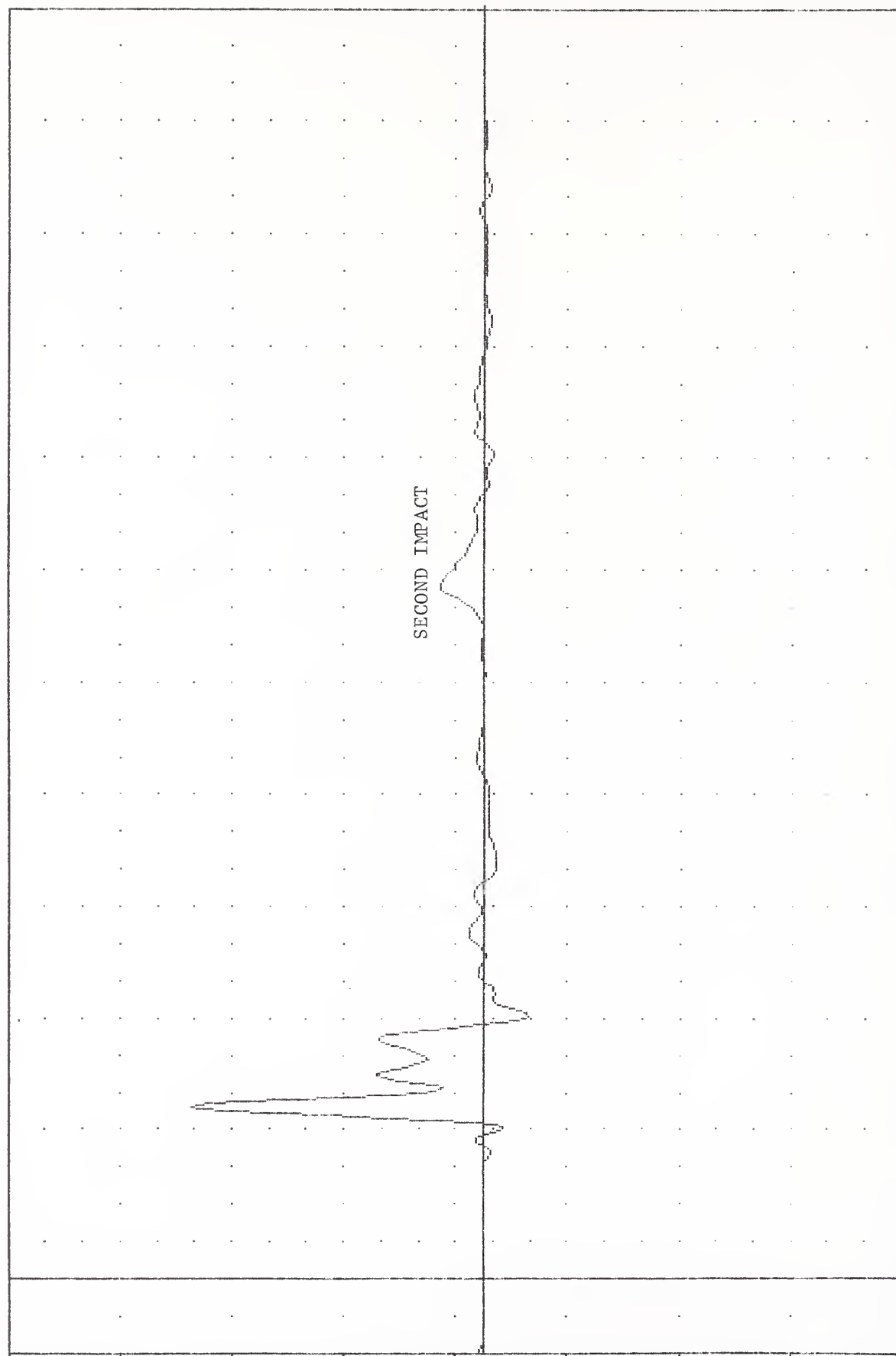
PLOT DATE 30-JUL-84 10:42:17
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -0.460 42.50 , 54.66 218.13



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LURYGA

TRC 840713 PLOT DATE 30-JUL-84 10:33:42
 SIDE AGGRESSIVE ATTRIBUTES
 841950000000
 LLRY61
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -32.732 70.00, 208.20 45.62

ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER LEFT LOWER RIB ACCELERATION Y AXIS

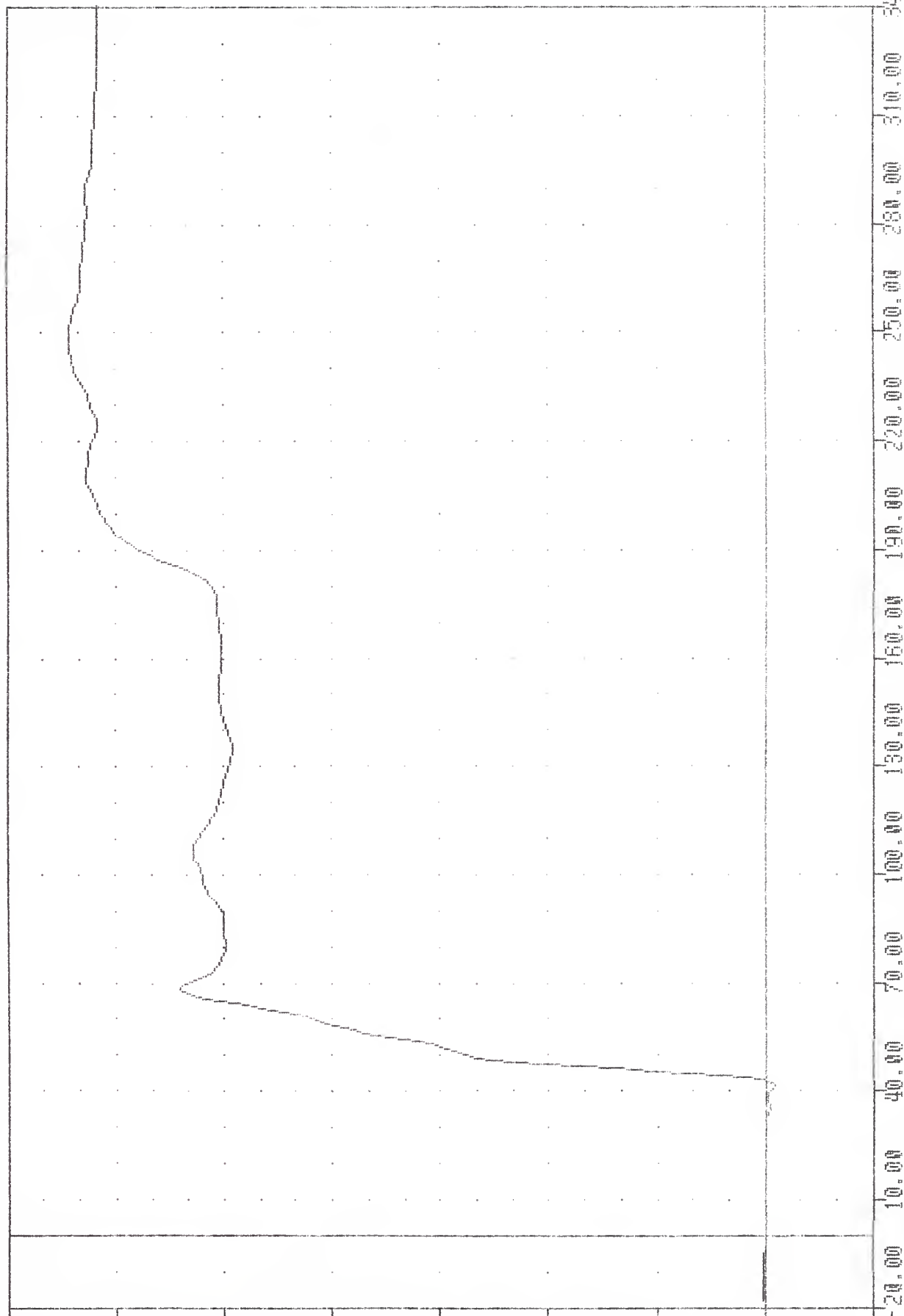
TRC ,840713
SIDE AGGRESSIVE ATTRIBUTES
84195000000
LLAYV1

PLOT DATE 30-JUL-84 10:42:17

FILTER = HSR 136/ 189/ -50

MIN. MAX VALUES = -0.690 40.63, 51.44 @ 247.50

VELOCITY (MPH)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LLAYG1

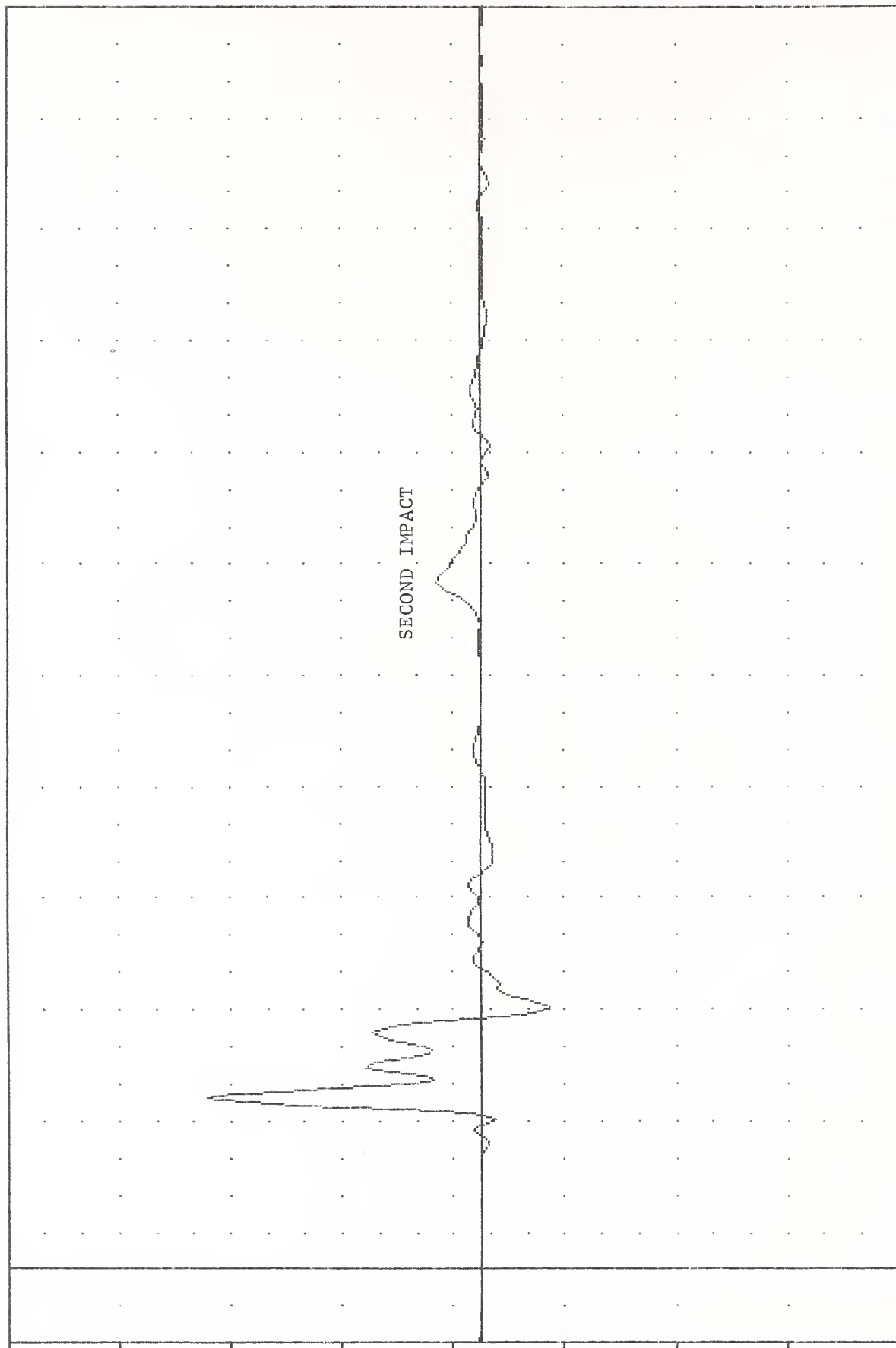
THC , 84W/13
 SIDE AGGRESSIVE ATTRIBUTES
 841950000000
 L1RY6A

PLOT DATE 30-JUL-84 10:33:42

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -49.65e 70.00, 196.89 e 45.62

ACCELERATION (G)



-

300.00

280.00

260.00

240.00

220.00

200.00

180.00

160.00

140.00

120.00

100.00

80.00

60.00

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20.00

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-360.00

-380.00

-400.00

-420.00

-440.00

-460.00

-480.00

-500.00

-520.00

-540.00

-560.00

-580.00

-600.00

-620.00

-640.00

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-700.00

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-740.00

-760.00

-780.00

-800.00

-820.00

-840.00

-860.00

-880.00

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-940.00

-960.00

-980.00

-1000.00

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-5300.00

-5320.00

-5340.00

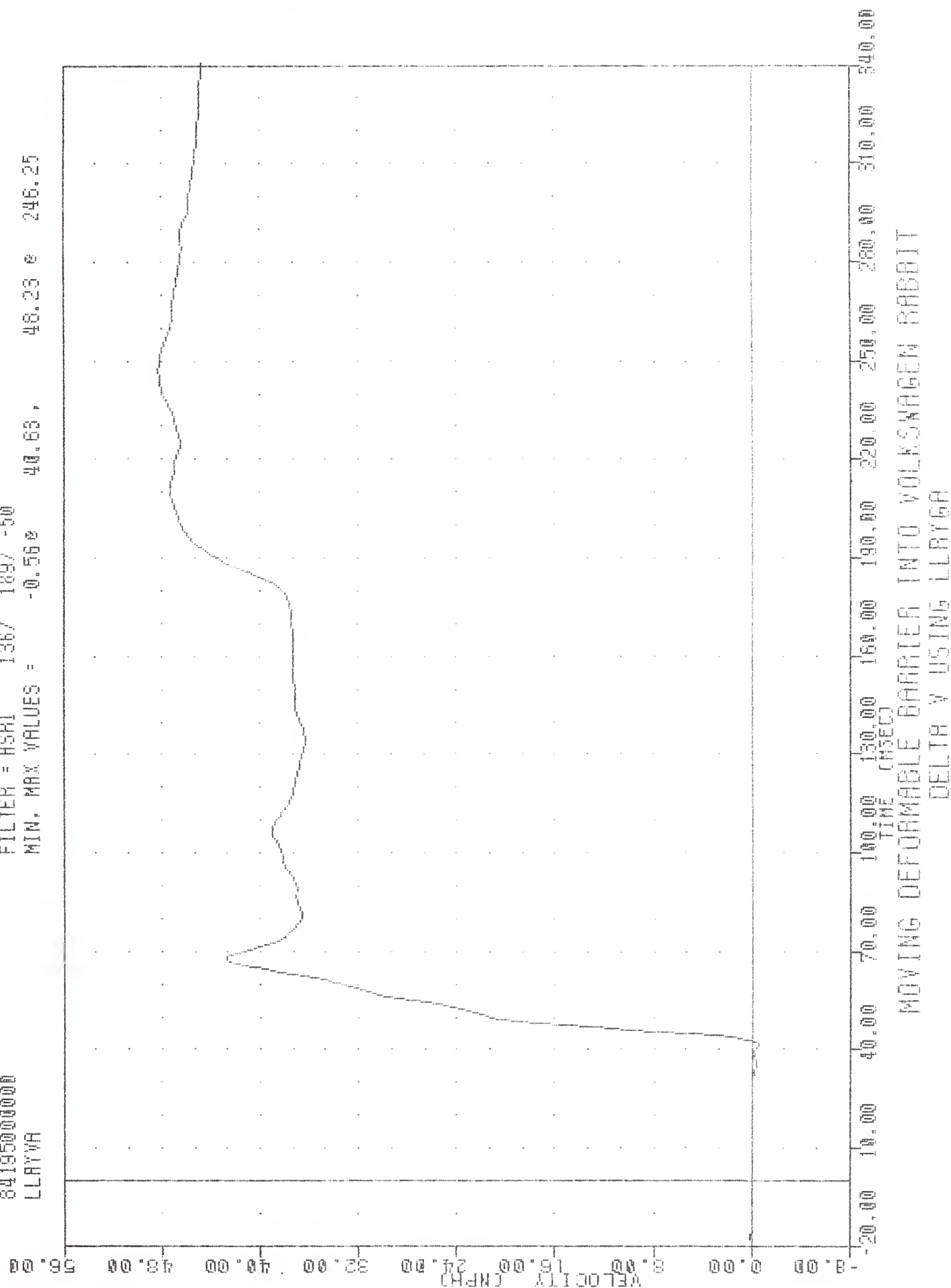
-5360.00

TRL 840713
 SIDE AGGRESSIVE ATTRIBUTES
 841950000000
 LLYVA

PLU1 DR16 30-JUL-84 10:42:17

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -0.560 40.68, 48.23 @ 246.25

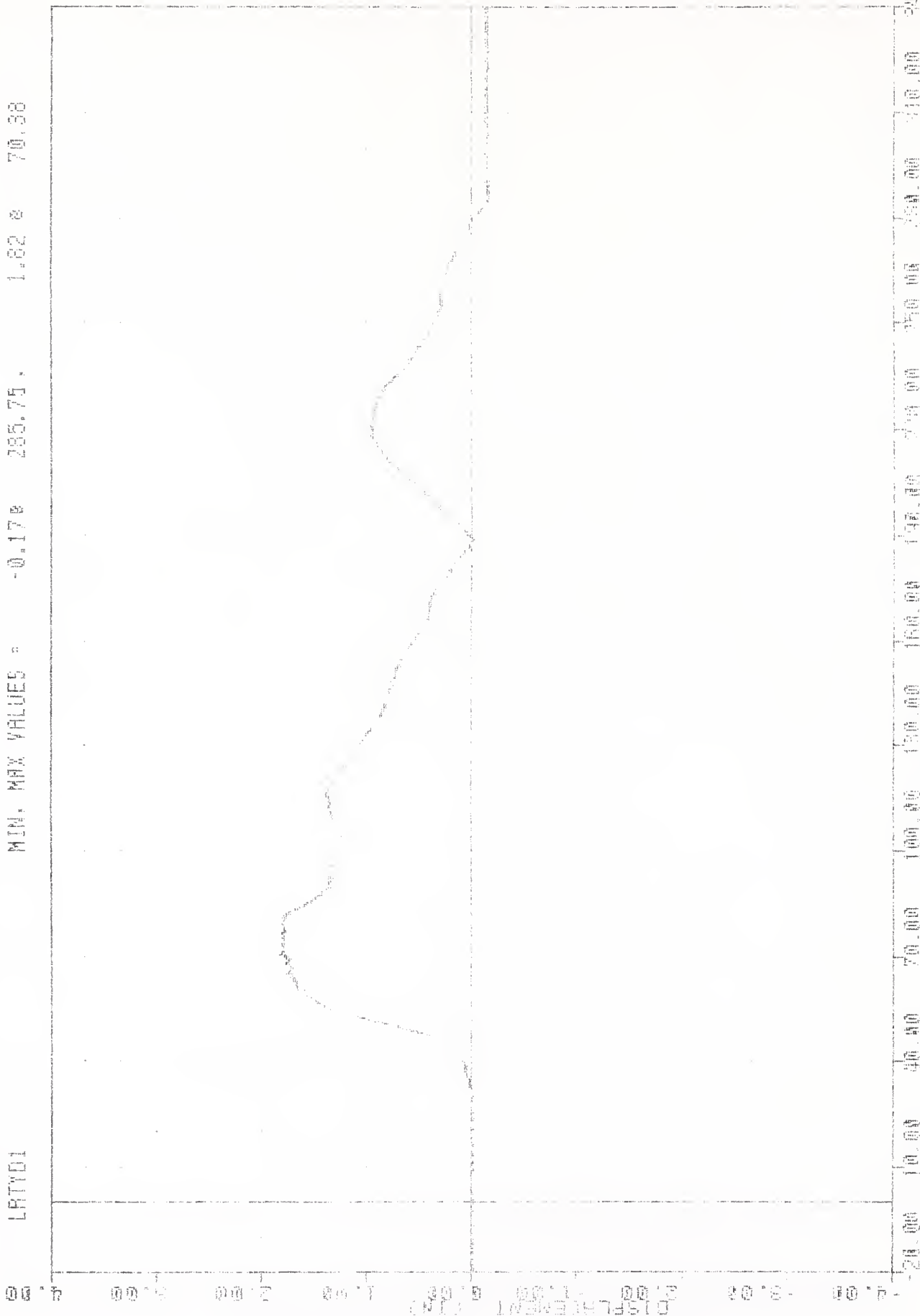


INL 04W/13
 SIDE AGGRESSIVE ATTRIBUTES
 04195000000
 LRTYD1

PLUT DATE 13-THU-84 14:17:00

FILTER = ALPF 1850/ 5217/ -40

MIN. MAX VALUES = -0.17% 285.75, 1.82 @ 70.38



MOVING DEFERRABLE CARRIED INTO VEHICLE WHICH
 DRIVER LEFT AIR TO SPINE DISPLACEMENT IN INCH

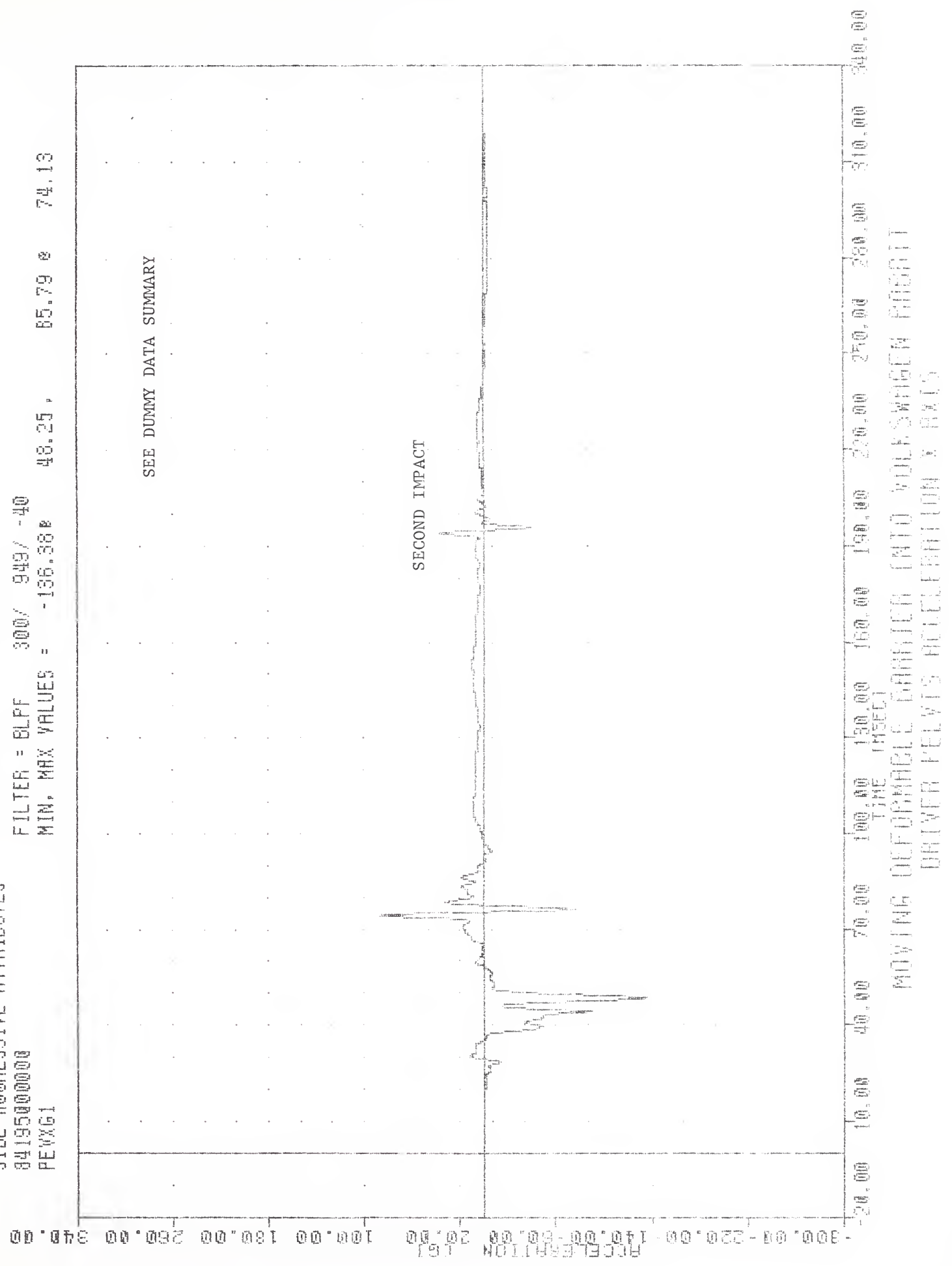
PLU1 DATE 13-AUG-04 14:17:05

INC 040710
SIDE AGGRESSIVE ATTRIBUTES
84195000000
PEVXG1

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -136.38 48.25, 85.79 74.13

SEE DUMMY DATA SUMMARY

SECOND IMPACT



TRC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 PEYV61

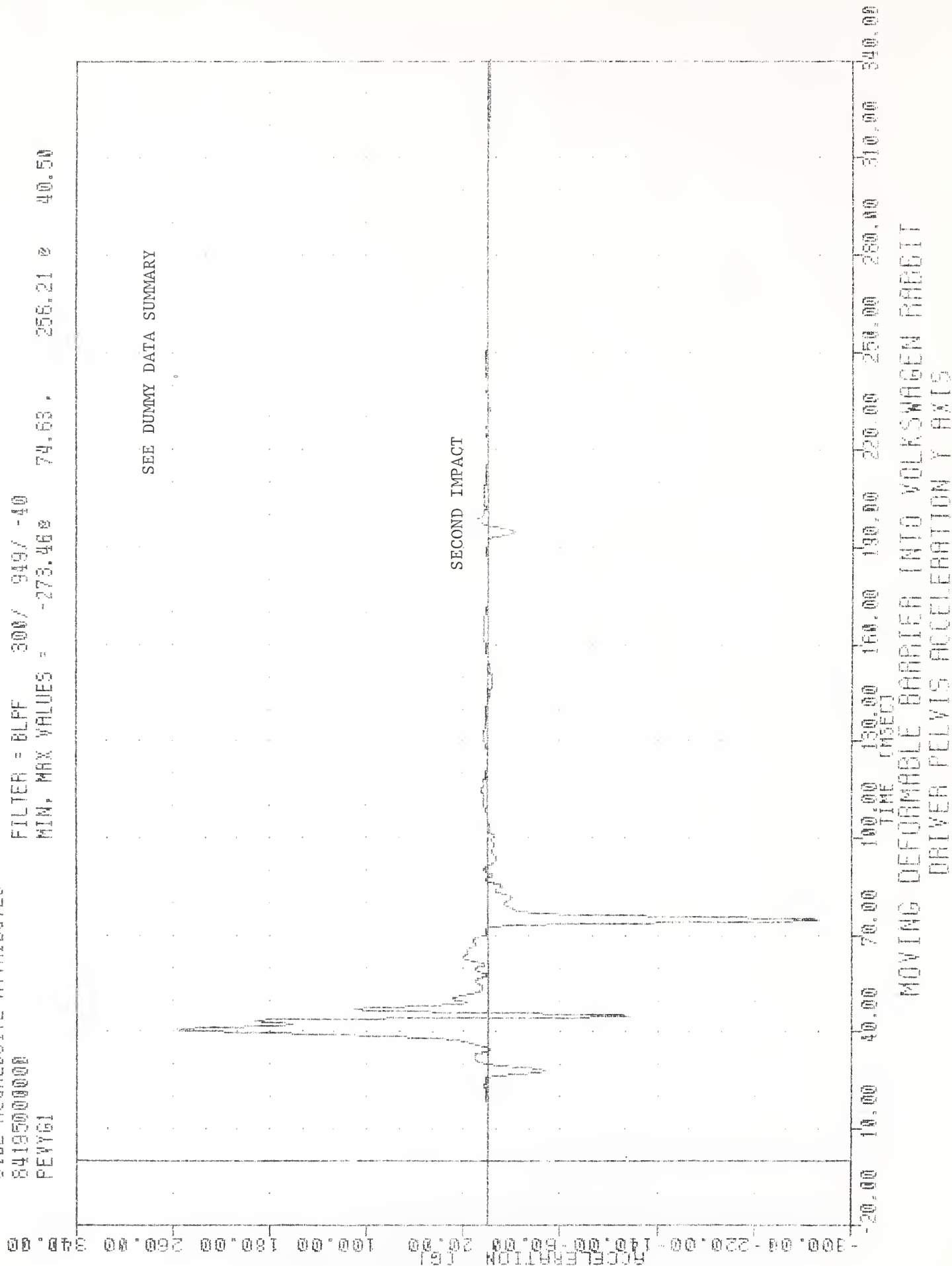
PLOT DATE 13-JUN-84 14:17:03

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -273.460 74.63. 256.21 0 40.50

SEE DUMMY DATA SUMMARY

SECOND IMPACT

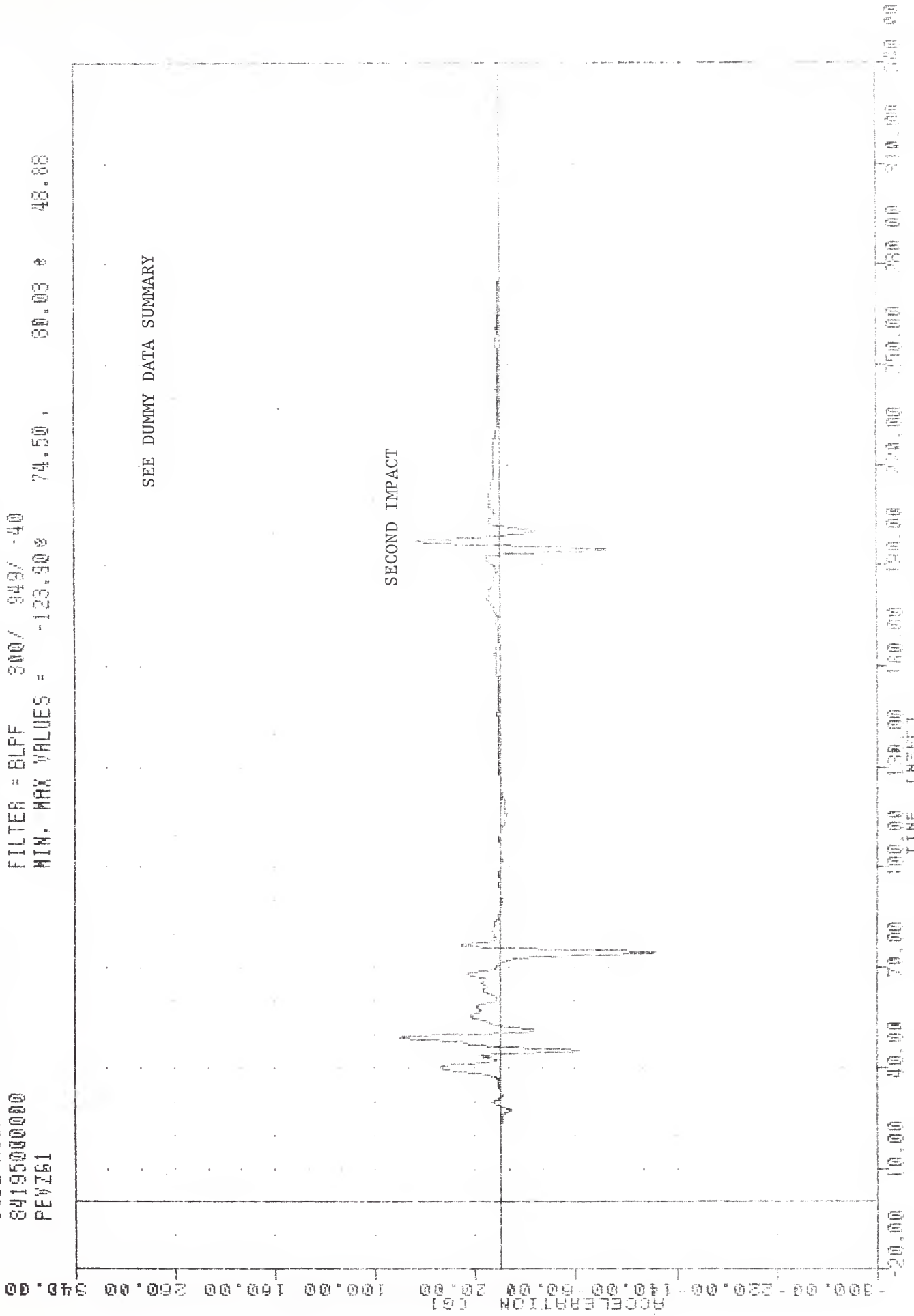


THU , 04/13
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 PEVZ61

FLU1 UH1E 13-HUB-04 14:17:05
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -123.900 74.50 80.03 48.88

SEE DUMMY DATA SUMMARY

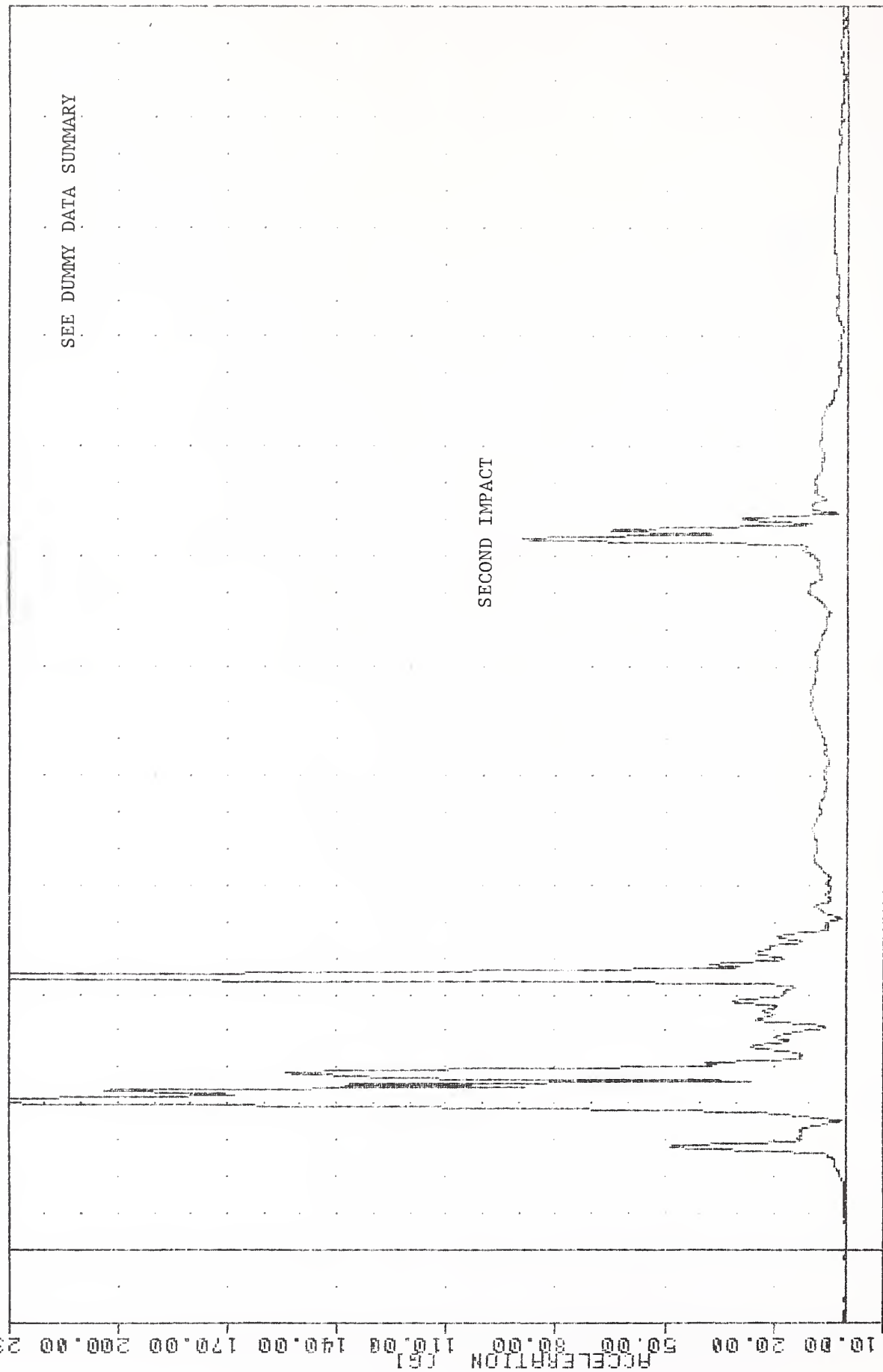
SECOND IMPACT



MOVING DEFORMABLE SURFACE (MDS) WITH DRIVER PELVIS ACCELERATION (G)

TRC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 PEVRG1

PLU1 UAT1 13-HUG-84 14:17:03
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = 0.072 -7.38, 306.07 74.63



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

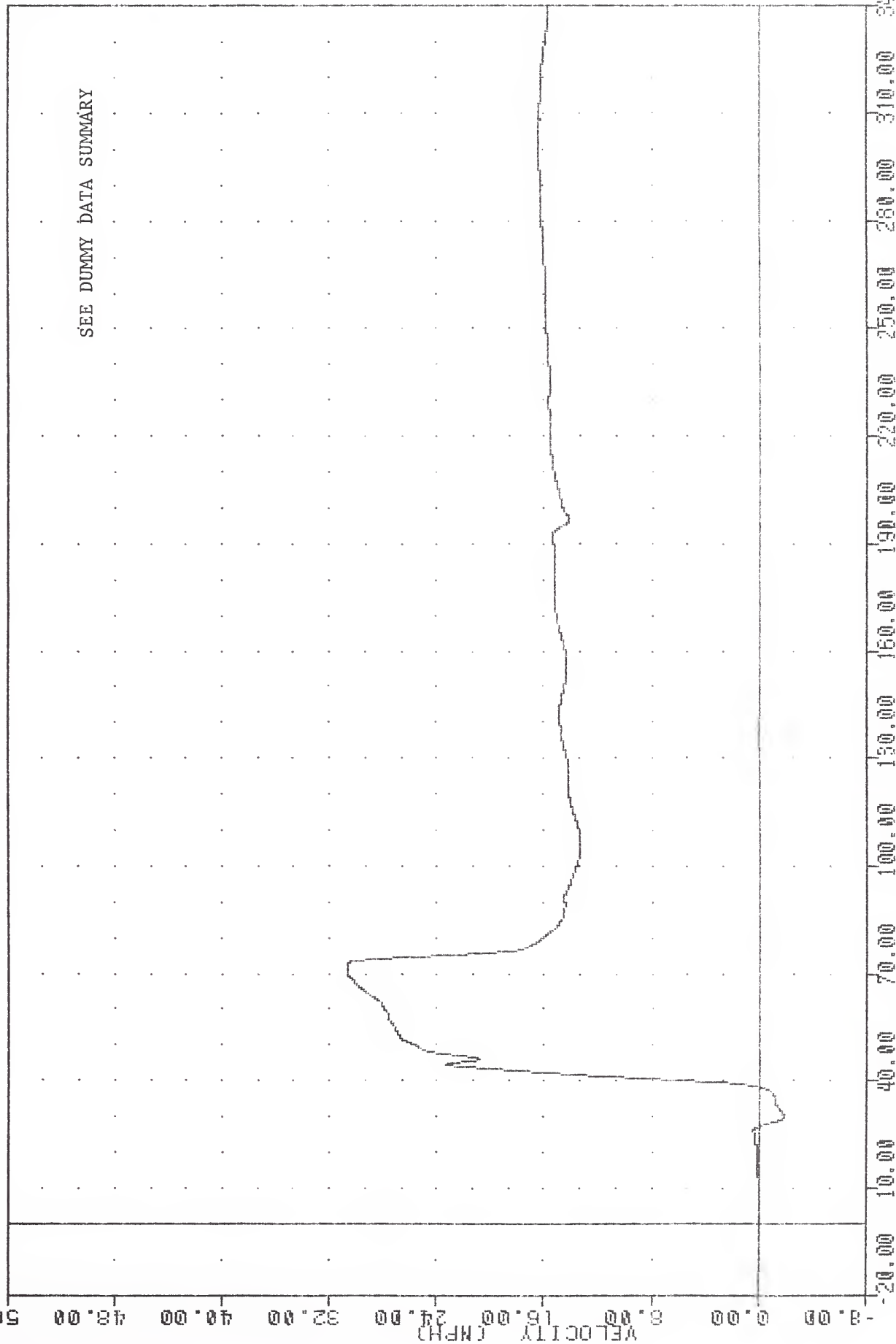
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER PELVIS RESULTANT

TRC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 PEVYV1

PLOT DATE 30-JUL-84 10:45:48

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -1.89e 30.00 , 30.71 e 72.00



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING PEVYGI

TRC , 840713

SIDE AGGRESSIVE ATTRIBUTES

84195000000

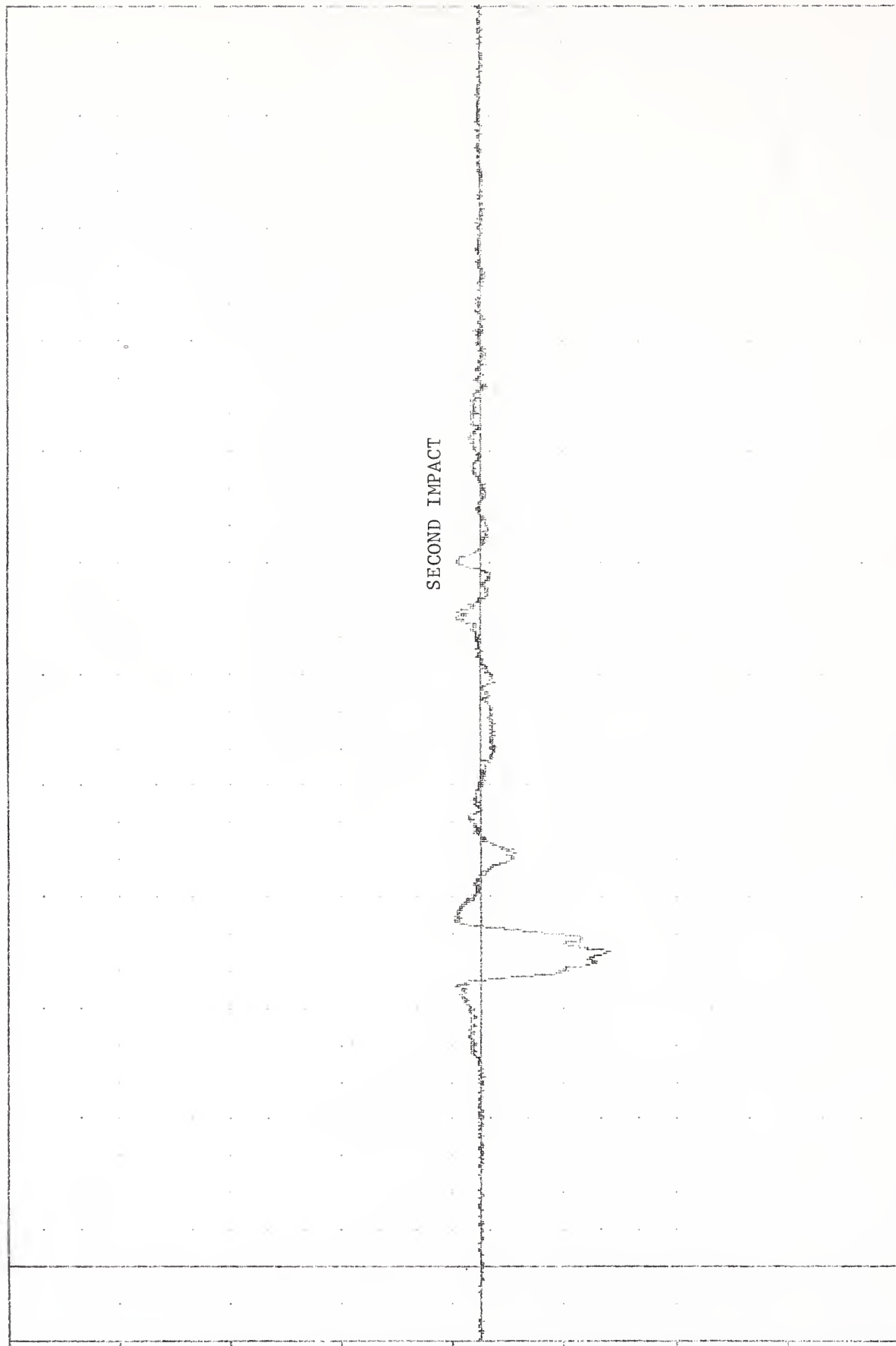
HEDXG3

PLOT DATE 13-HUG-84 14:17:03

FILTER = ALPF 1650/ 5217/ -40

MIN. MAX VALUES = -92.510 85.00 19.45 93.25

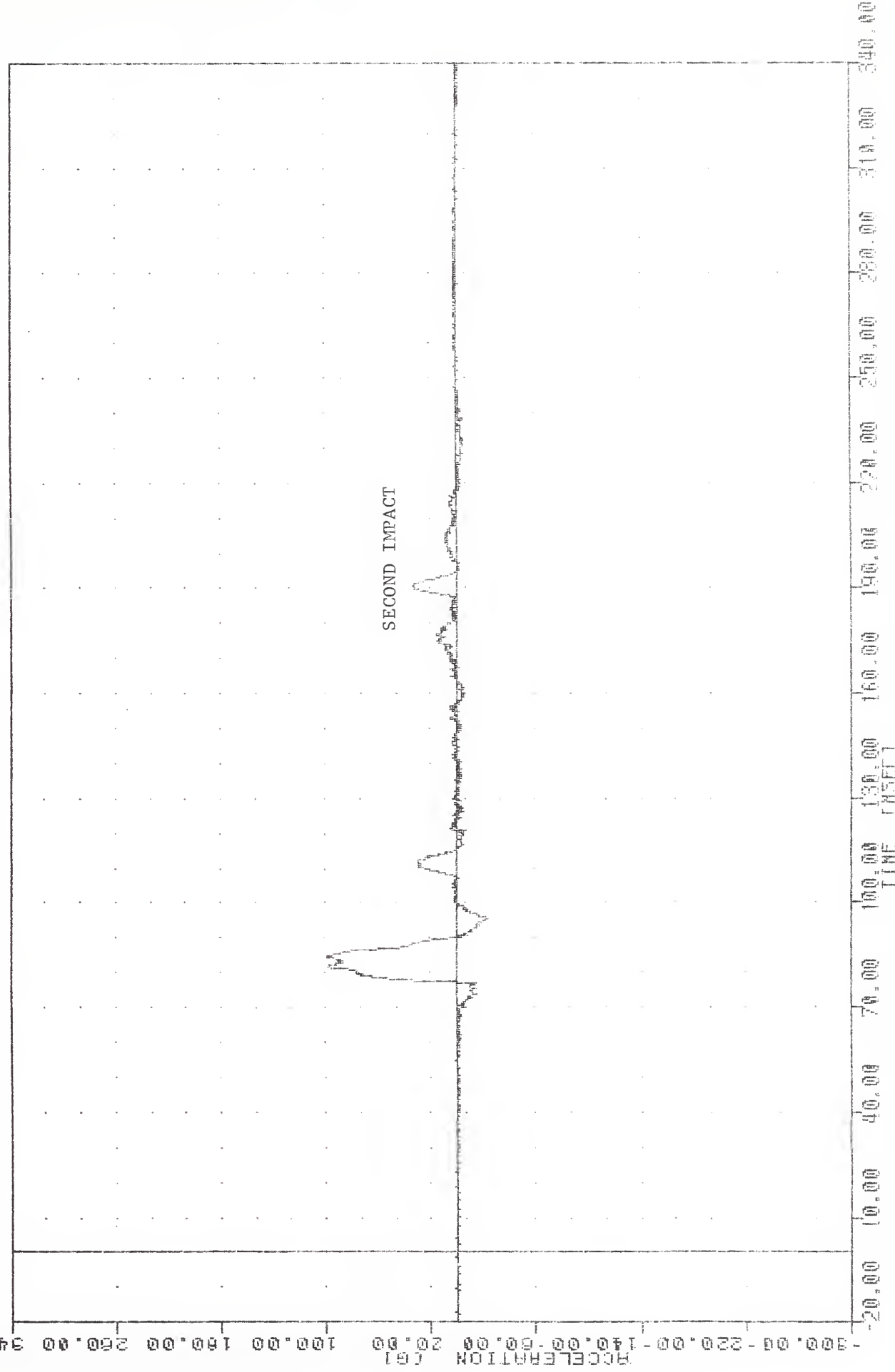
ACCELERATION (G)



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER HEAD ACCELERATION X AXIS

TAC 840713 13-AUG-84 14:17:03
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 HEDY63
 FILTER = ALPF 1650/ 5217/ -40
 MIN, MAX VALUES = -23.06 95.50 96.91 81.75



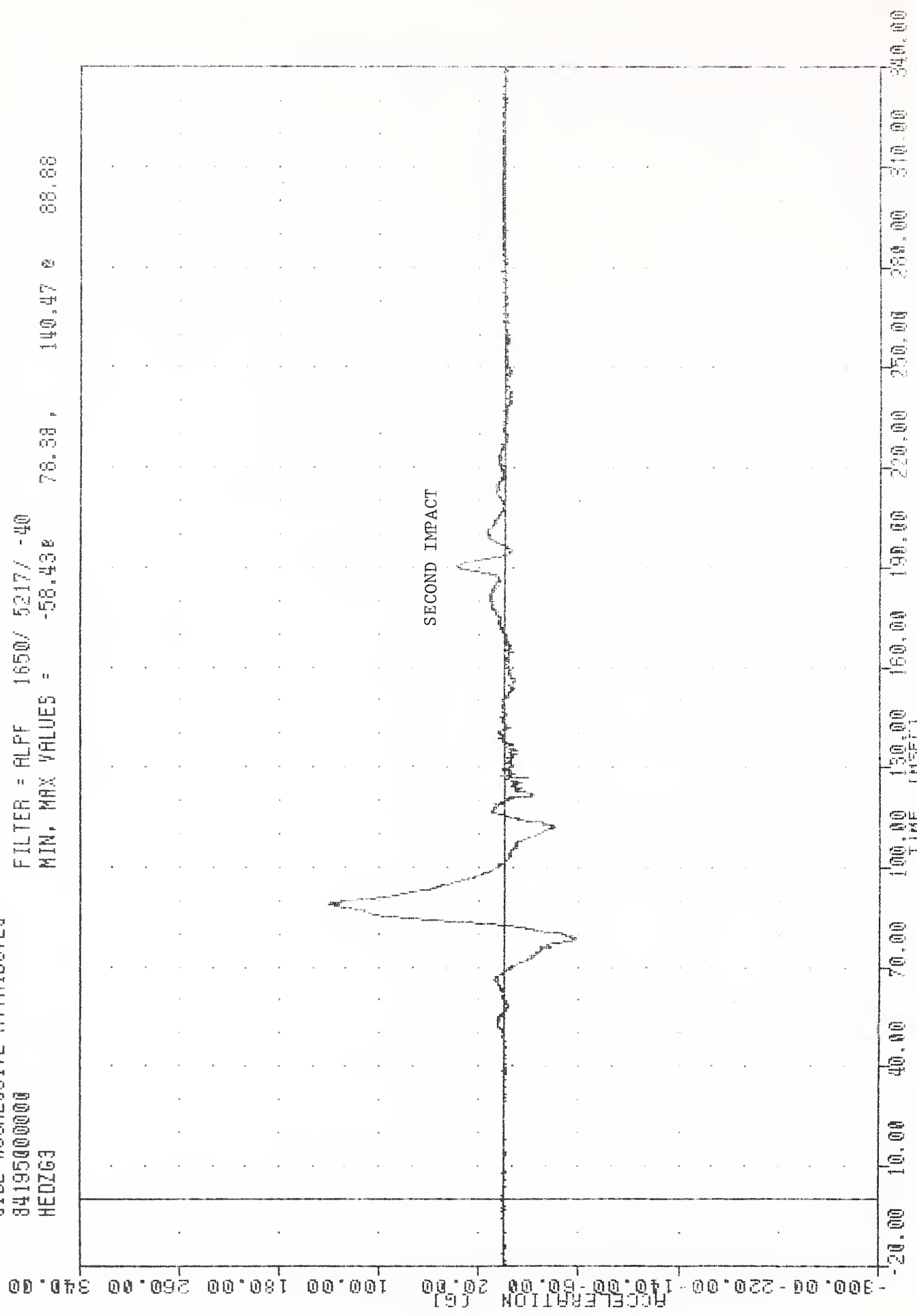
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN PASSGT
 PASSENGER HEAD ACCELERATION Y AXIS

IHC 840713
 SIDE AGGRESSIVE ATTRIBUTES
 841950000000
 HEDZG3

PLOT DATE 13-HUG-84 14:17:03

FILTER = ALPF 1650/ 5217/ -40

MIN. MAX VALUES = -58.438 78.38, 140.47 88.88



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER HEAD ACCELERATION Z AXIS

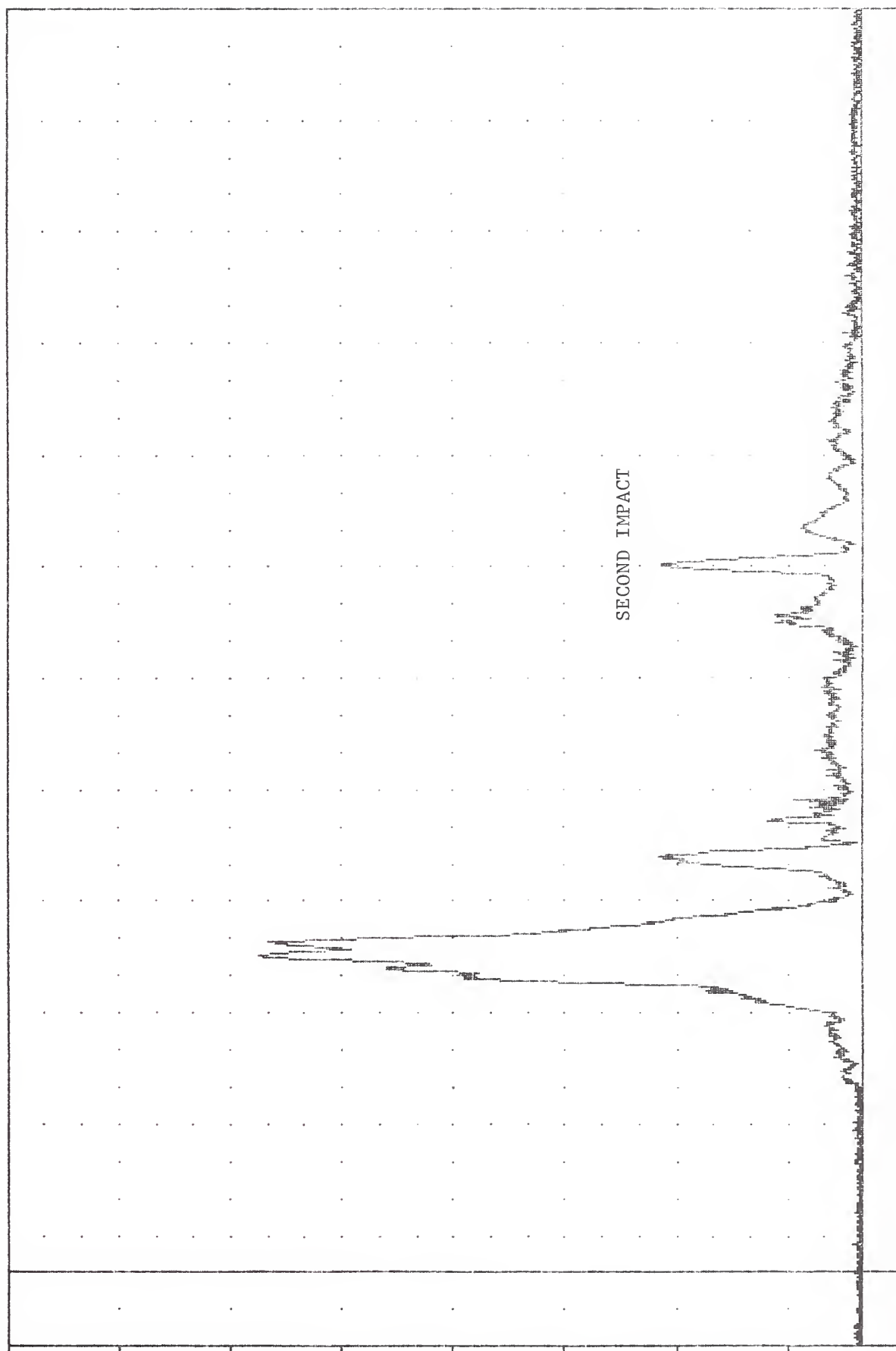
TAC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 HEAD63

PLU1 DATE 13-AUG-84 14:17:03

FILTER = ALPF 1650/ 5217/ -40

MIN. MAX VALUES = 0.068 -6.75 , 162.31 85.13

ACCELERATION (G)



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (msec)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER HEAD RESULTANT

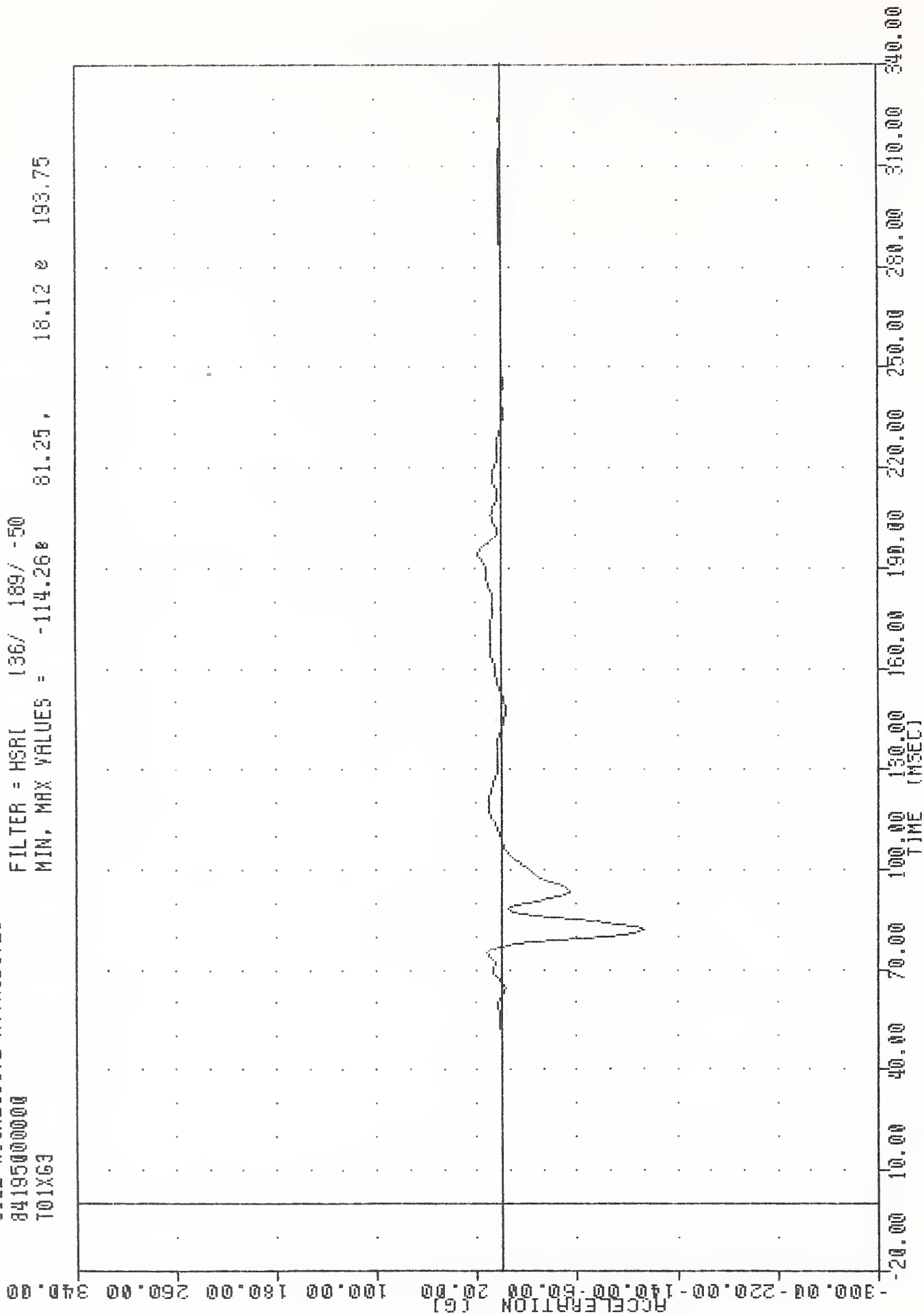
SIDE AGGRESSIVE ATTRIBUTES

84195000000

T01XG3

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -114.260 81.25, 18.12 0 193.75



SIDE AGGRESSIVE ATTRIBUTES

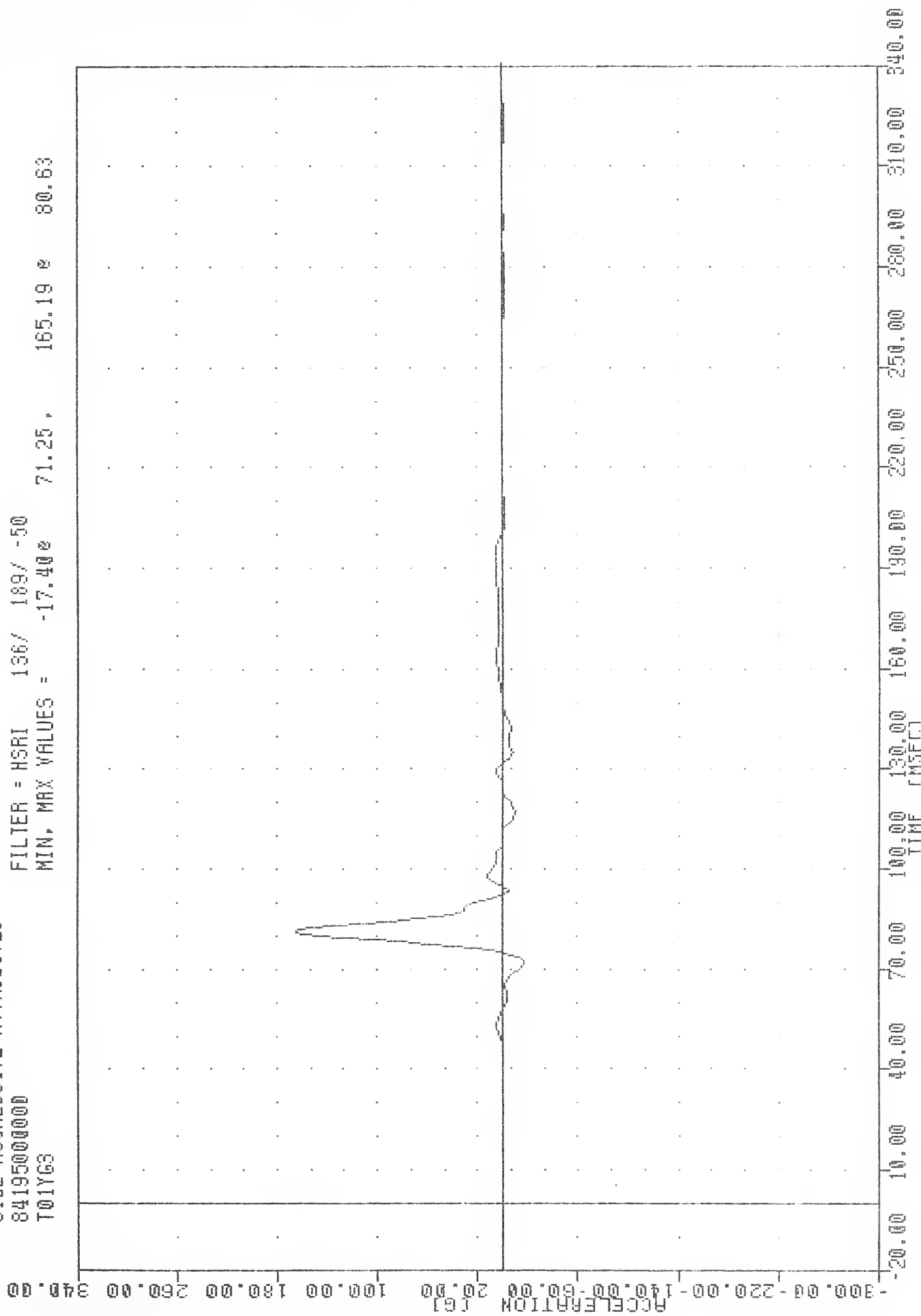
84195000000

T01YG3

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -17.40%

71.25, 165.19, 80.63



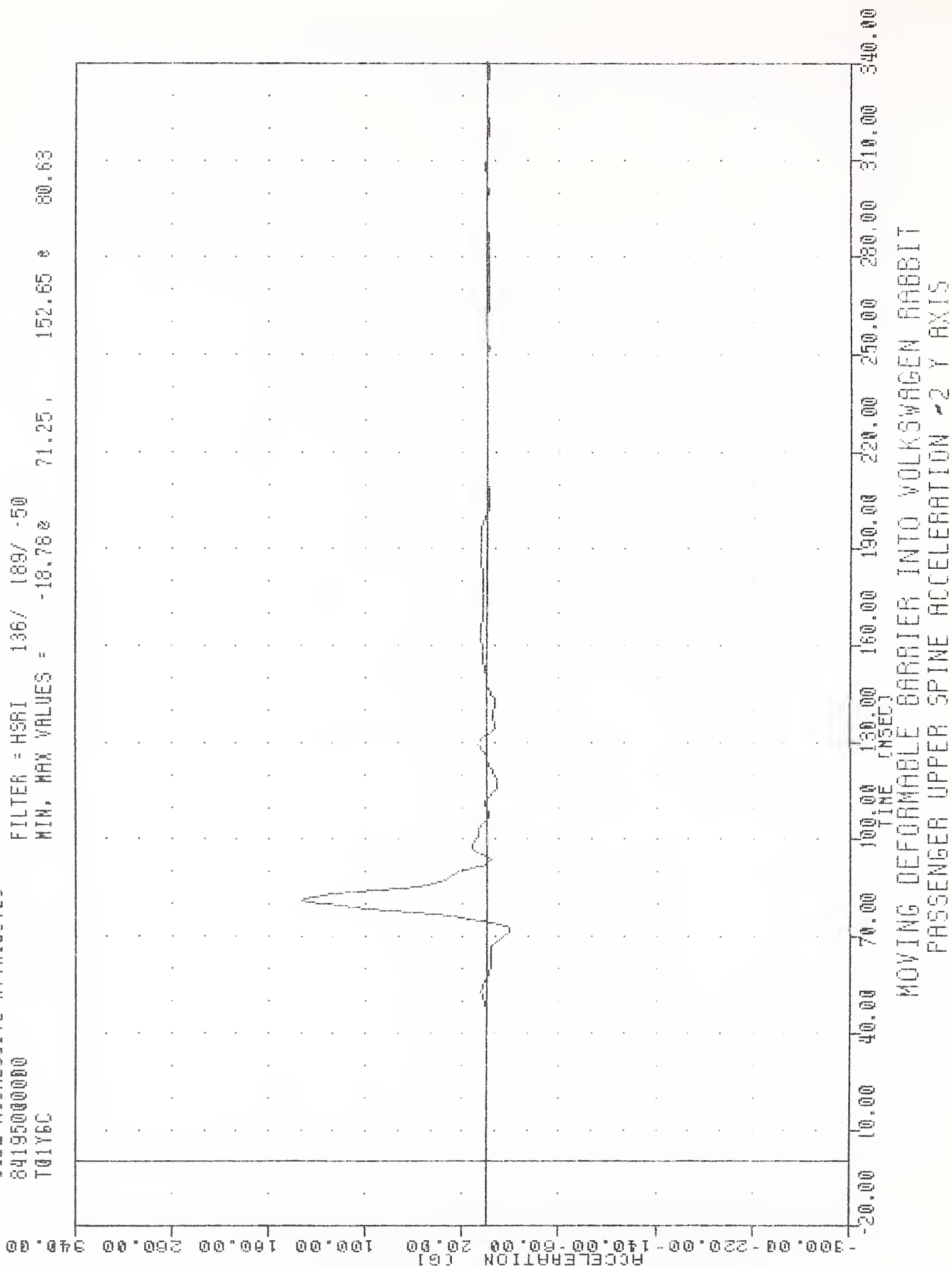
SIDE AGGRESSIVE ATTRIBUTES

841950000000

T01Y6C

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -18.78 71.25, 152.65 80.63



SIDE AGGRESSIVE ATTRIBUTES

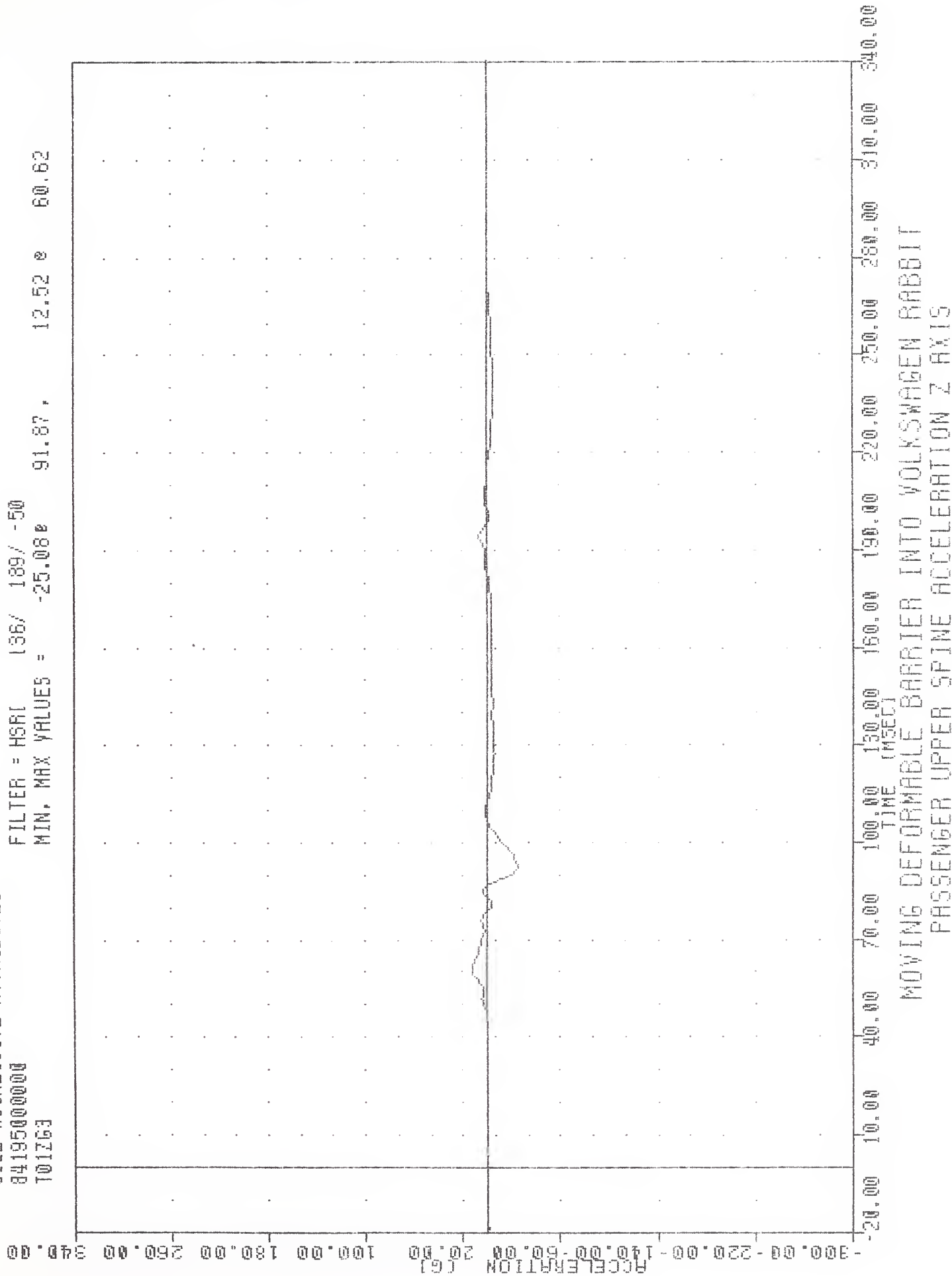
84195000000

T01263

FILTER = HSRI 136/ 139/ -50

MIN, MAX VALUES = -25.080

91.87, 12.52 0 60.62

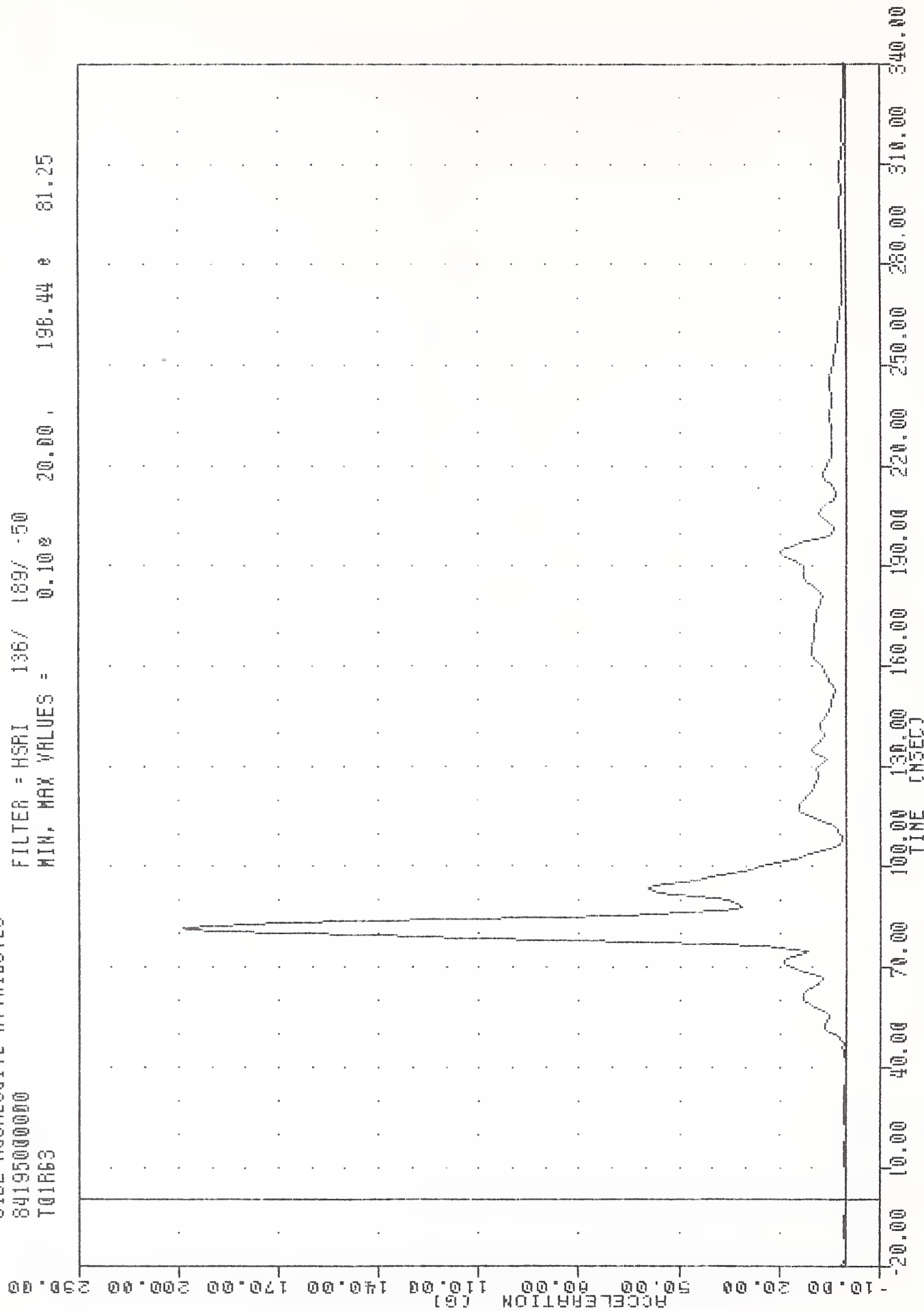


TAC
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 TQ1R63

PLOT DATE 30-JUL-84 11:31:22

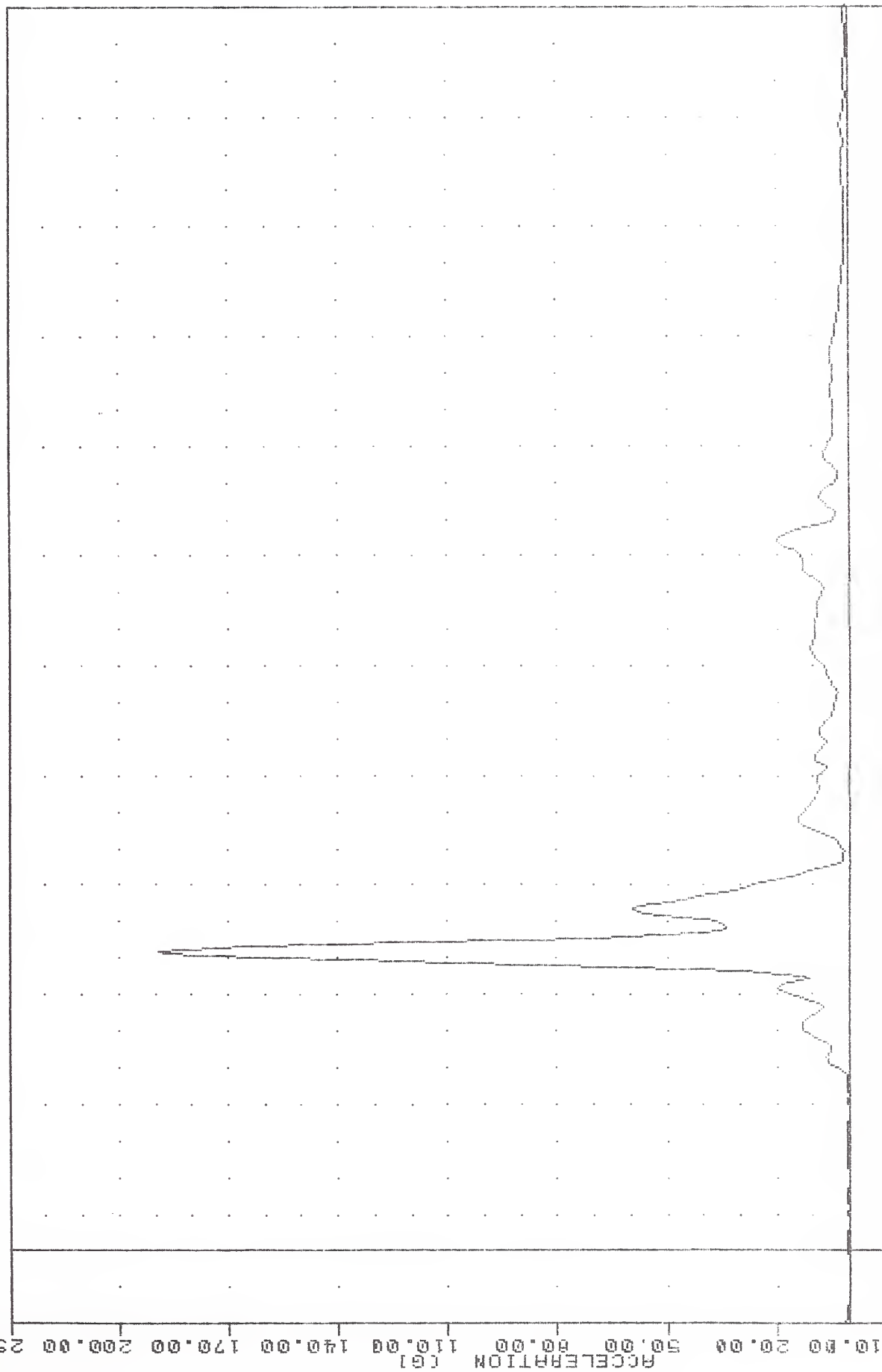
FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = 0.10e 20.00, 196.44 e 81.25



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER UPPER SPINE RESULTANT

TRC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 T01REC
 PLOT DATE 30-JUL-64 11:25:40
 FILTER = HSB1 136/ 189/ -50
 MIN. MAX VALUES = 0.12e 36.68 , 189.25 e 81.25



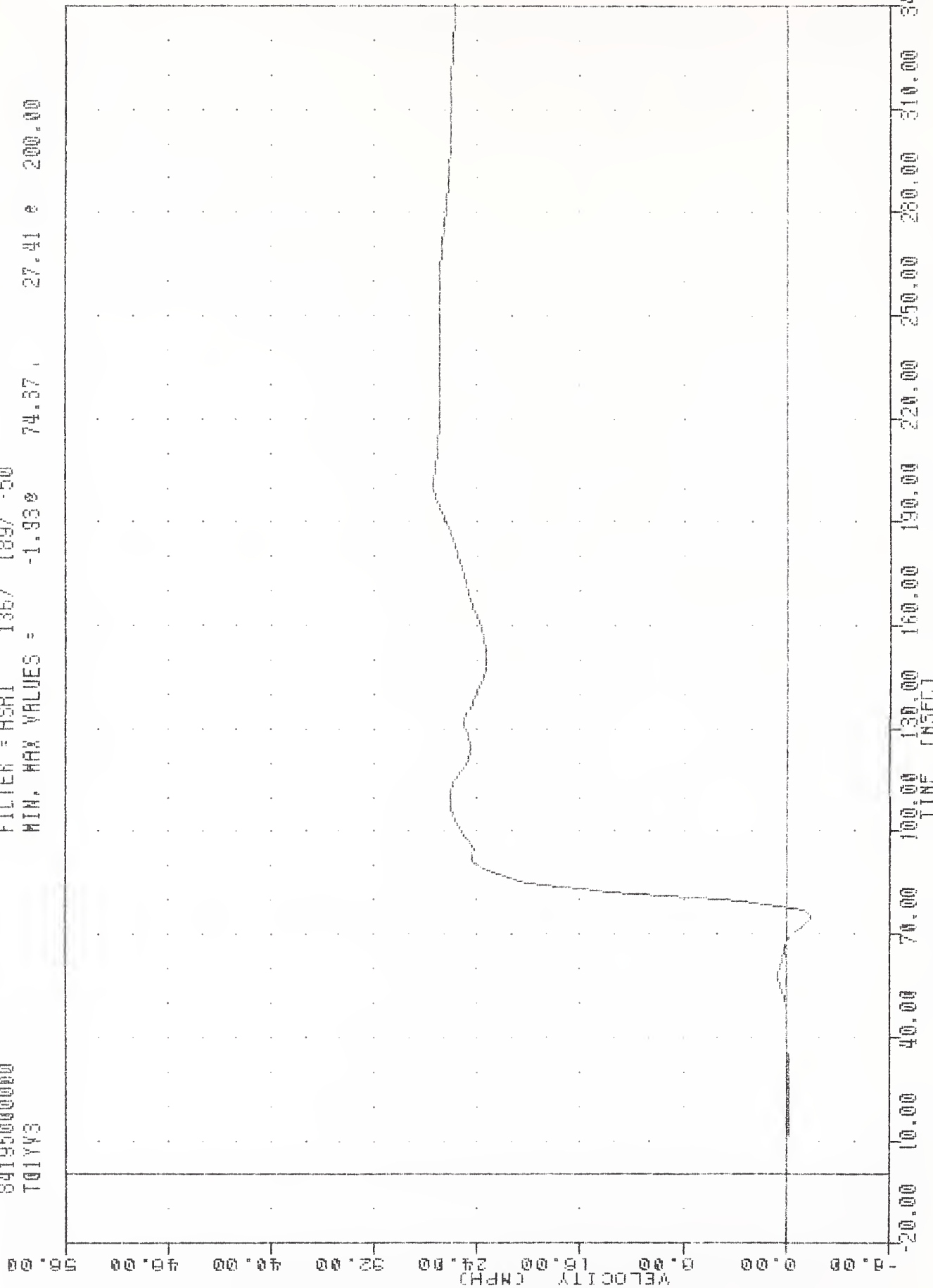
-10.00
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 340.00
 TIME (msec)
 MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER UPPER SPINE RESULTANT USING T01YGC

TAC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 841950000000
 T01YV3

PLOT DATE 30-JUL-84 10:42:17

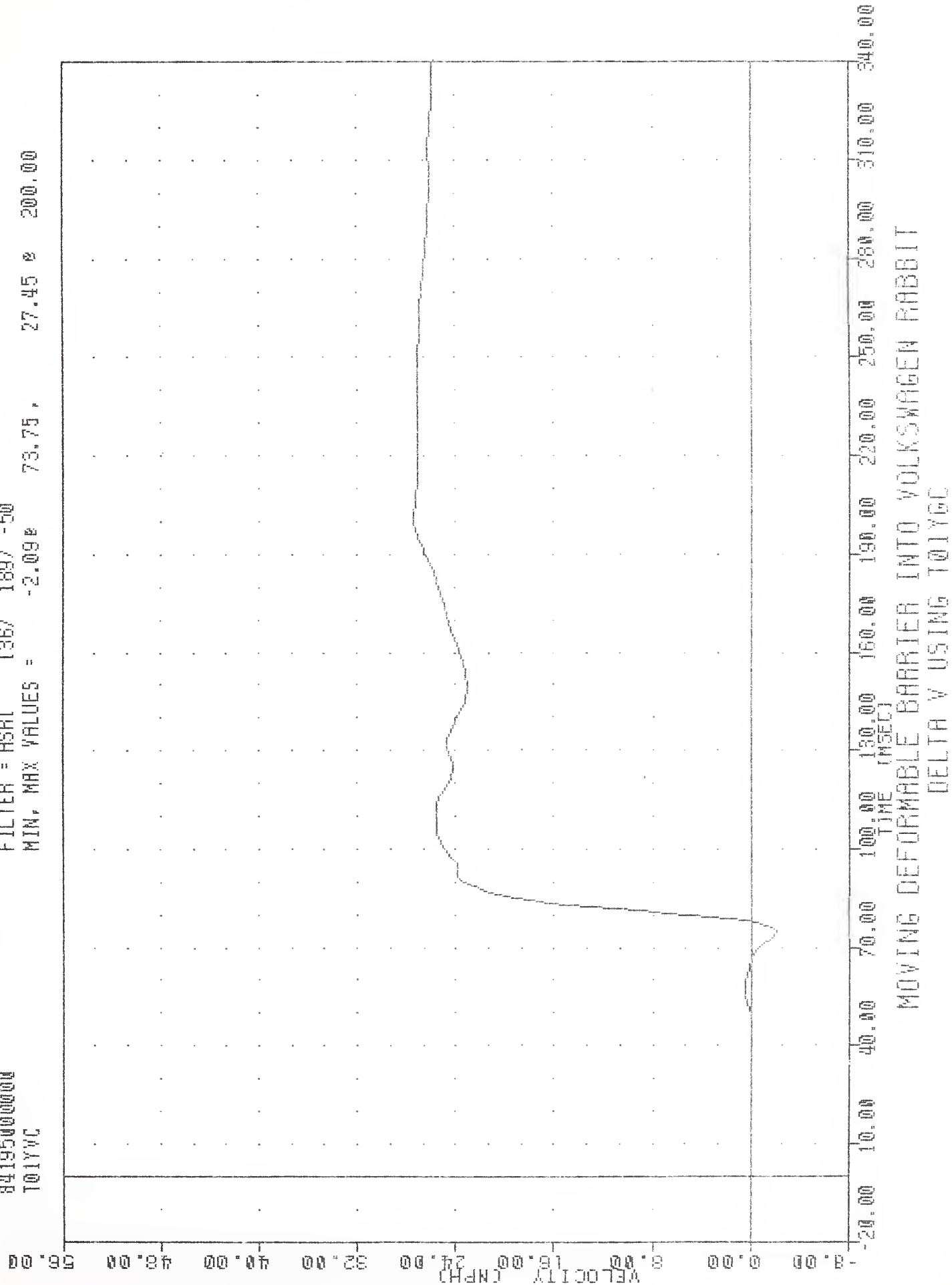
FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -1.930 74.37, 27.41 e 200.00



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T01YV3

TRC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 T01YVC
 PLOT DATE 30-JUL-84 10:42:17
 FILTER = HSR1 136/ 189/ -50
 MIN, MAX VALUES = -2.09e 73.75, 27.45 e 200.00



TRC , 840713 PLOT DATE 30-JUL-84 10:33:42

SIDE AGGRESSIVE ATTRIBUTES

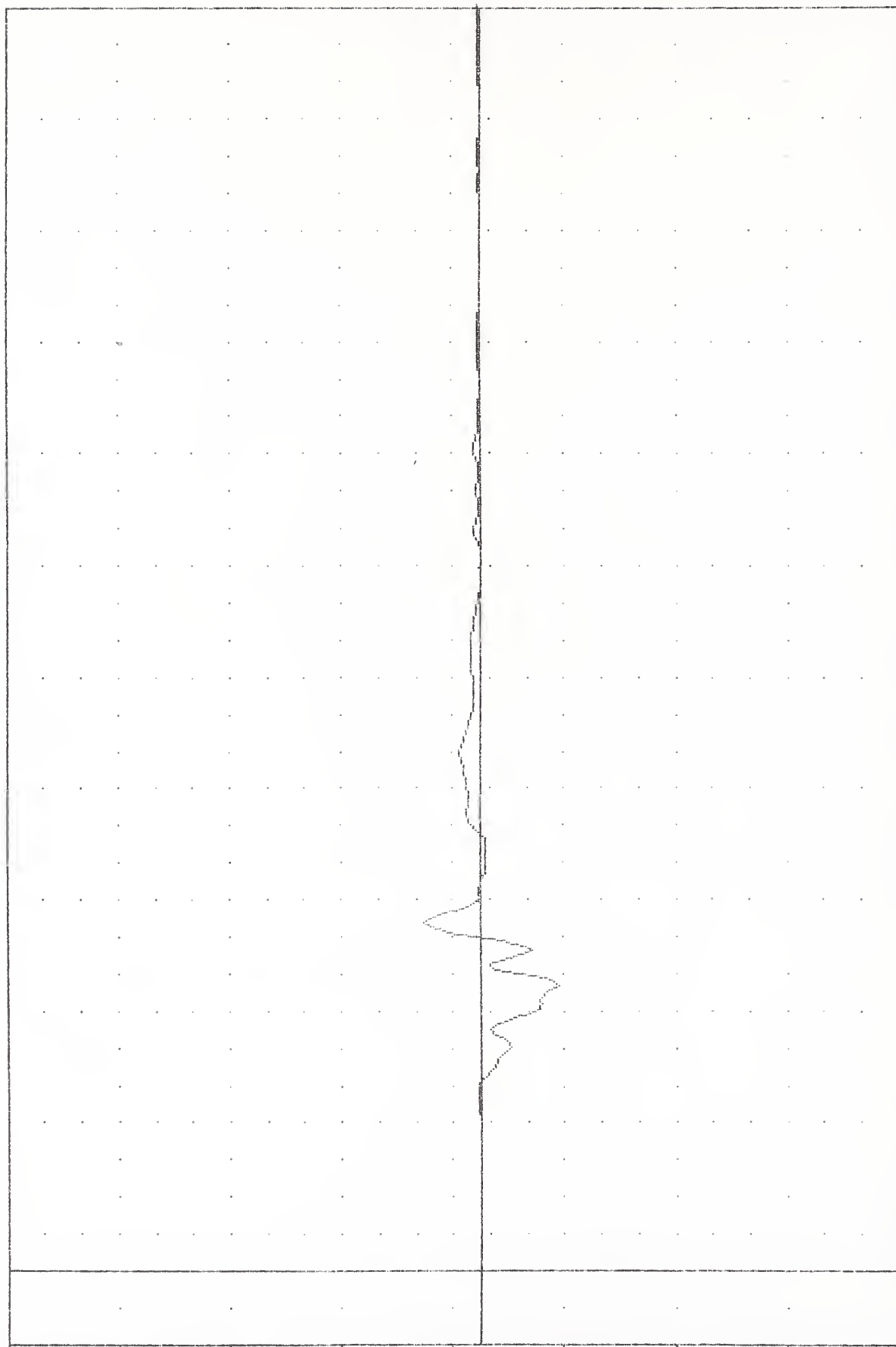
841950000000

T12X63

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -55.33e 76.25, 40.22 e 93.13

ACCELERATION (G)



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
TIME (msec)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LOWER SPINE ACCELERATION X AXIS

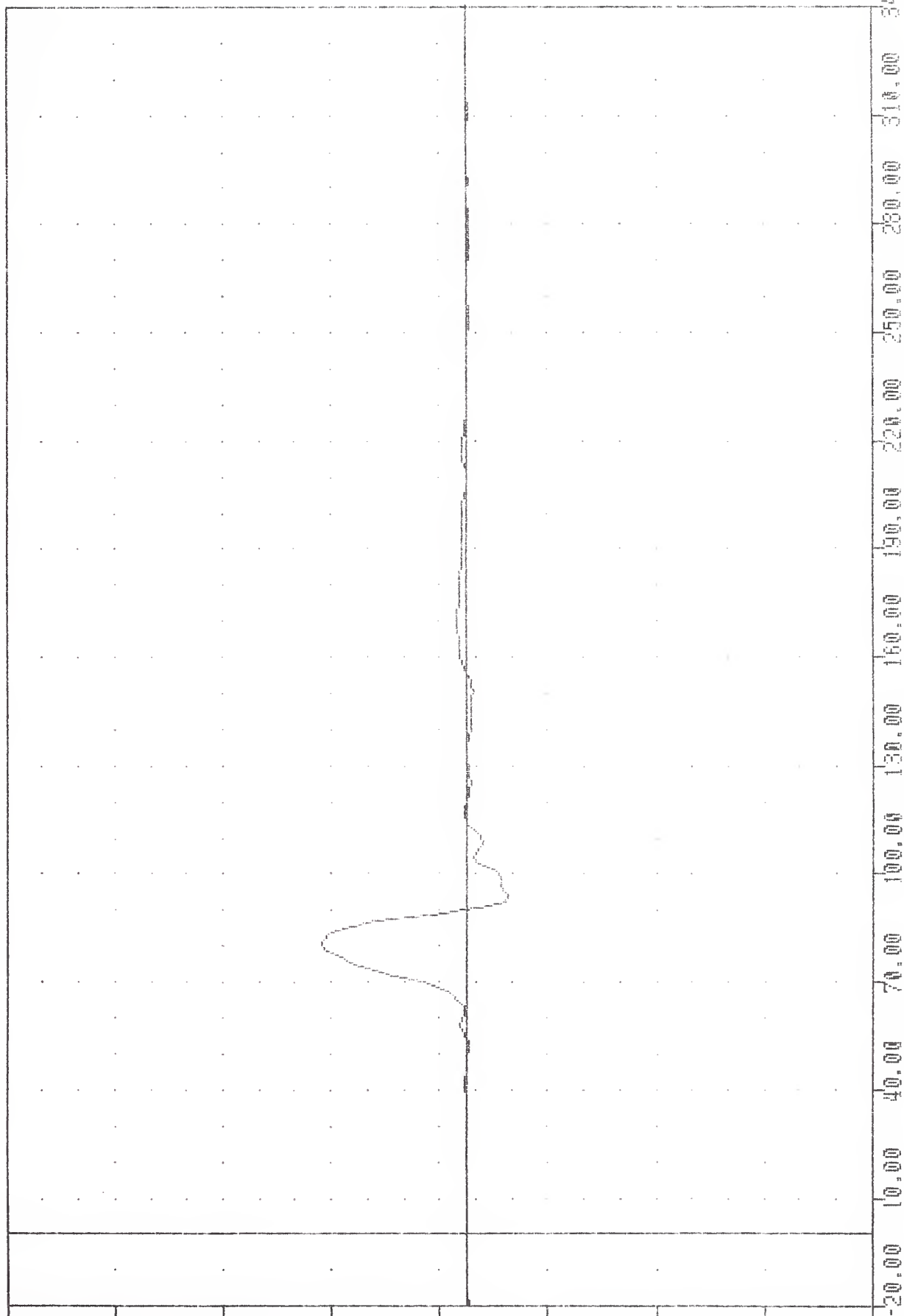
TAC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 841950000000
 T12Y63

PLOT DATE 30-JUL-84 10:33:42

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -30.43e 93.13, 107.69 e 80.00

ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER LOWER SPINE ACCELERATION Y AXIS

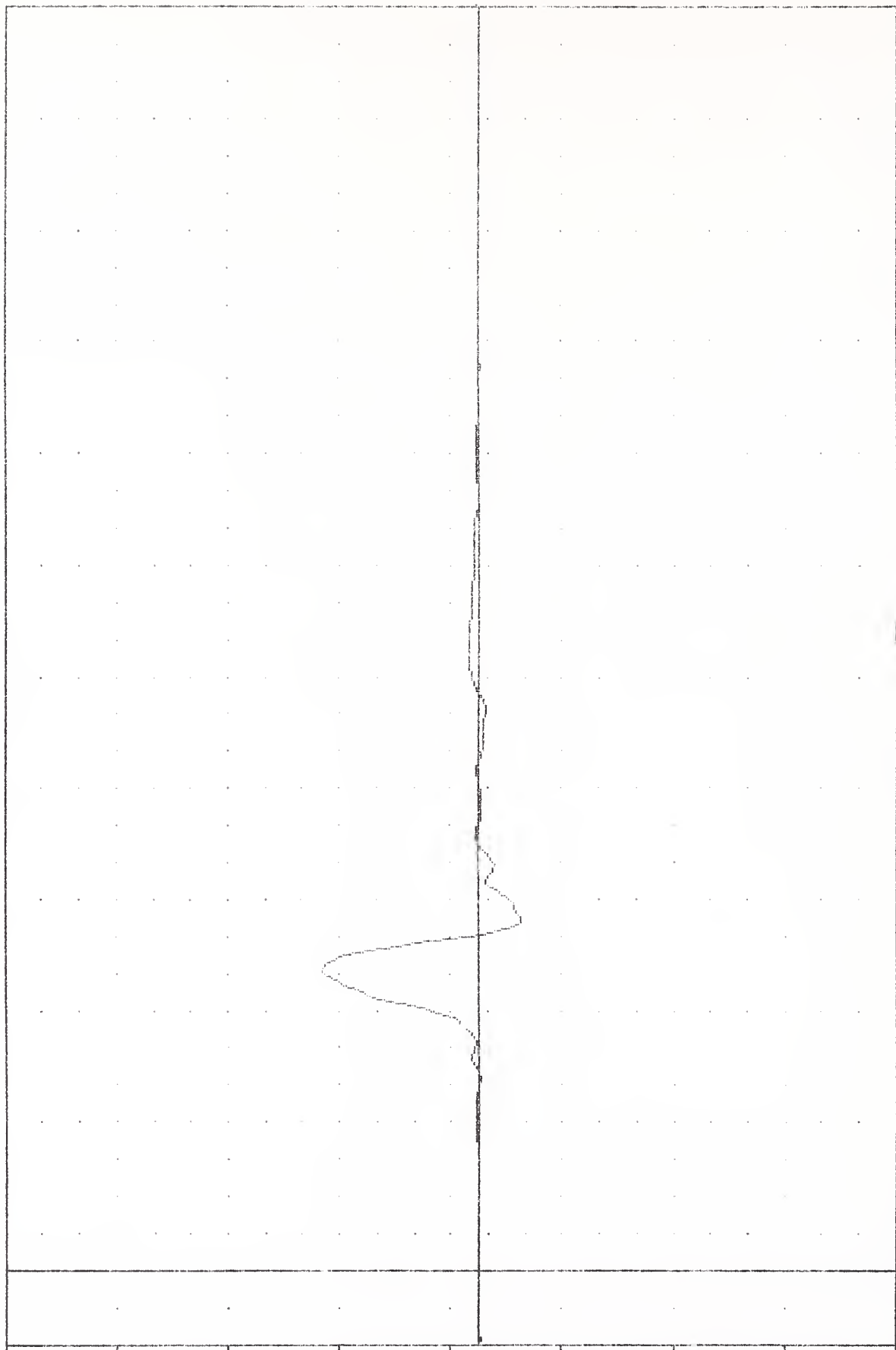
TRC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 T12YGC

PLU1 UNIT 30-JUL-84 10:33:42

FILTER = HSR1 136/ 189/ -50

MIN. MAX VALUES = -30.38e 93.75, 111.79 e 80.63

ACCELERATION (G)



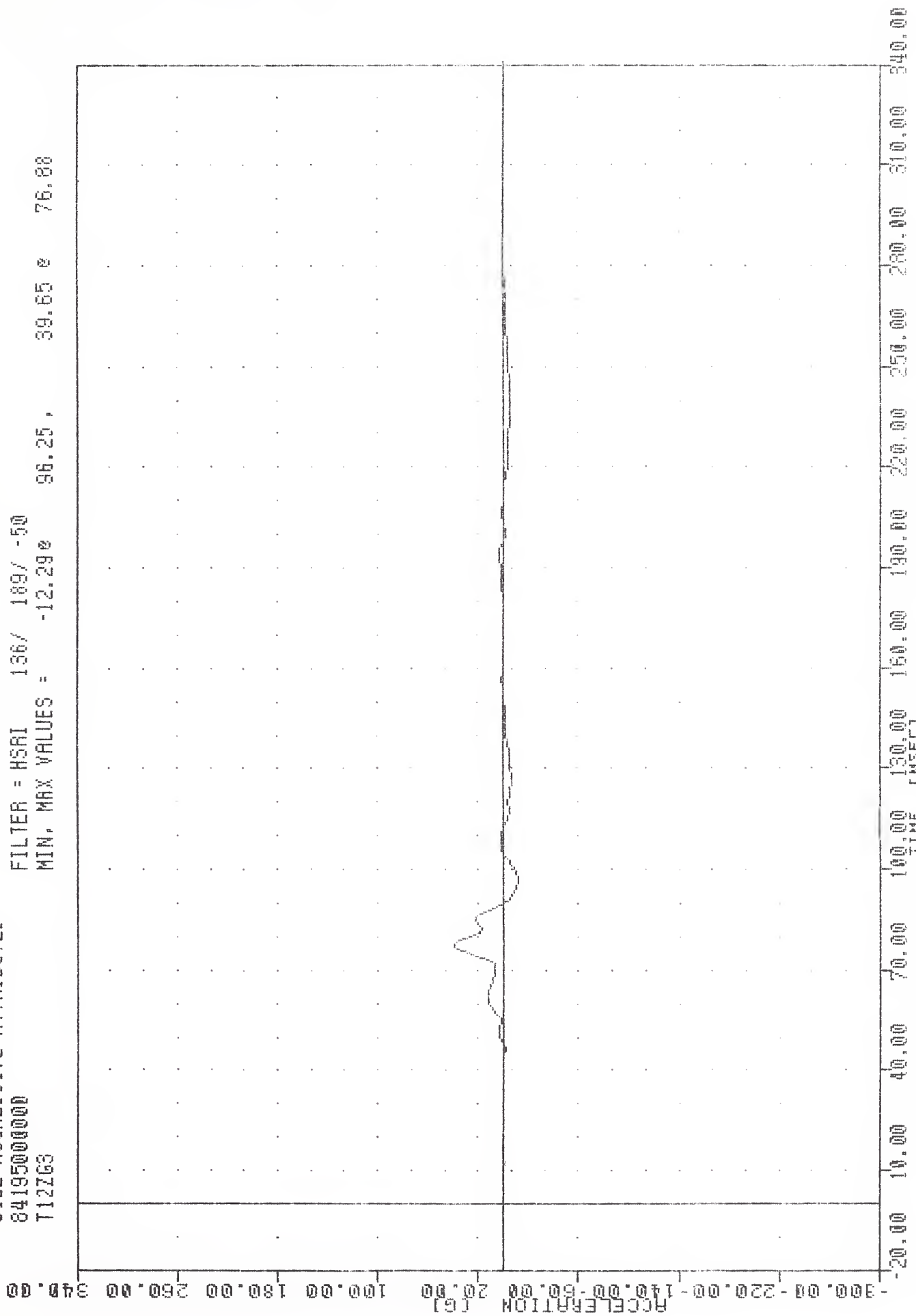
TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER LOWER SPINE ACCELERATION -2 Y AXIS

TRC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 T12Z63

PLOT DATE 30-JUL-84 10:33:42

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -12.290 96.25, 39.65 0 76.80



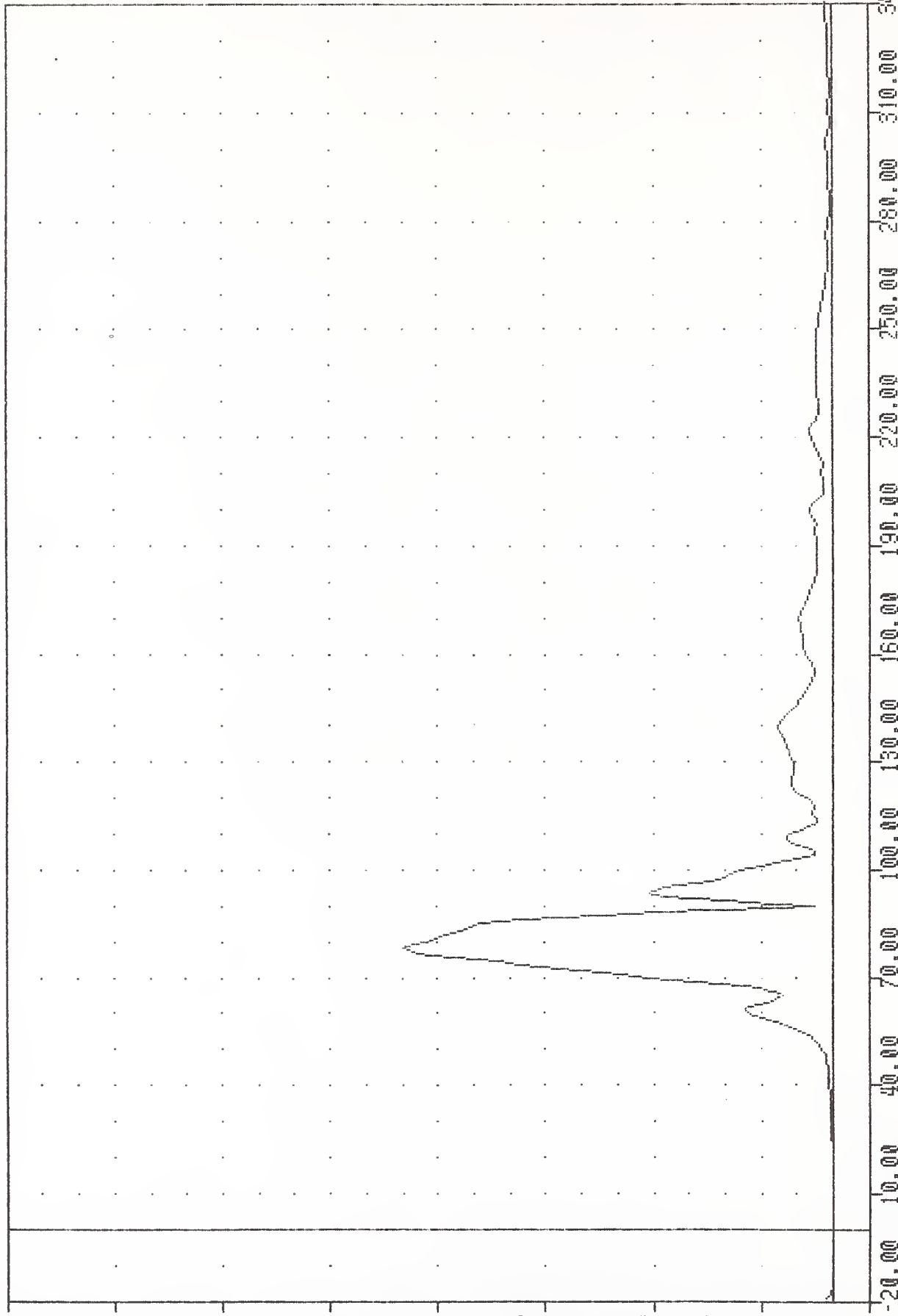
TRC , 840713
SIDE AGGRESSIVE ATTRIBUTES
84195000000
T12RG3

PLOT DATE 30-JUL-84 11:31:22

FILTER = HSR1 136/ 189/ -50

MIN. MAX VALUES = 0.03e -4.38 , 119.53 e 77.50

ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LOWER SPINE RESULTANT

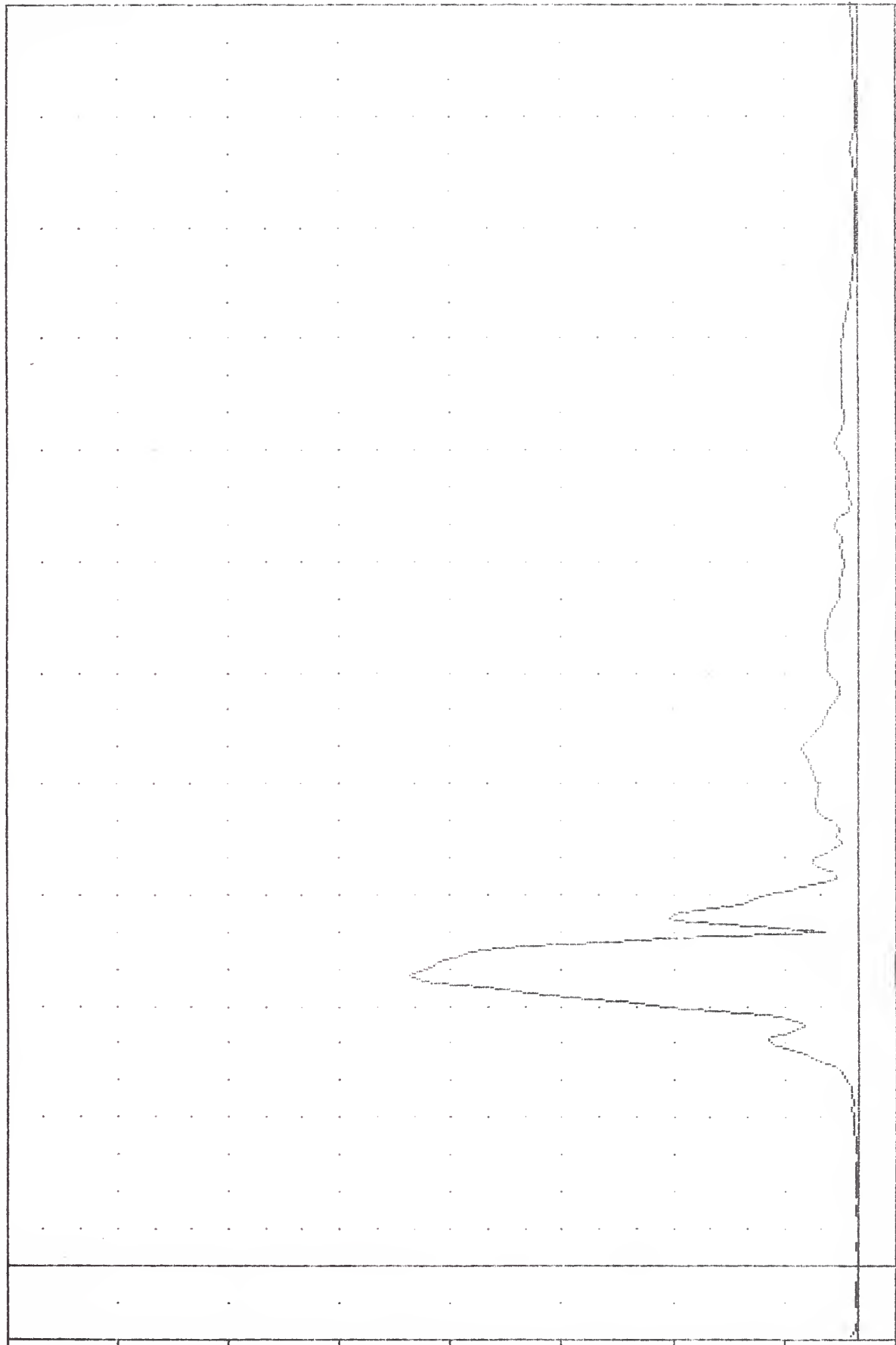
TRC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 T12RGC

PLOT DATE 13-AUG-84 14:18:02

FILTER = HSR 136/ 189/ -50

MIN. MAX VALUES = 0.040 9.37, 121.23 77.50

ACCELERATION (G)



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

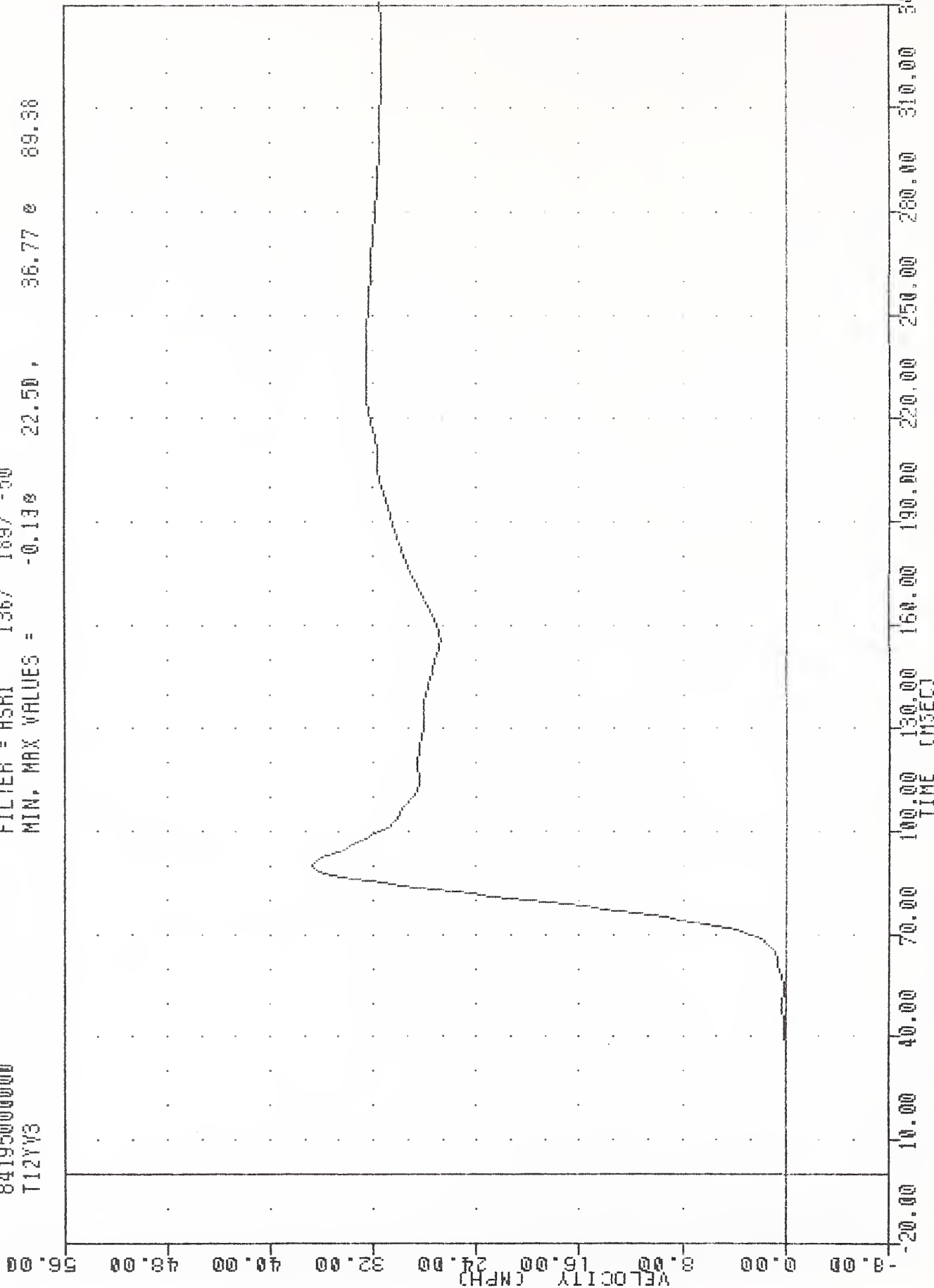
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER LOWER SPINE RESULTANT USING T12Y6C

TRC , 840713
SIDE AGGRESSIVE ATTRIBUTES
84195000000
T12YY3

PLUT DATE 30-JUL-84 10:42:17

FILTER = HSRI 136/ 189/ -50

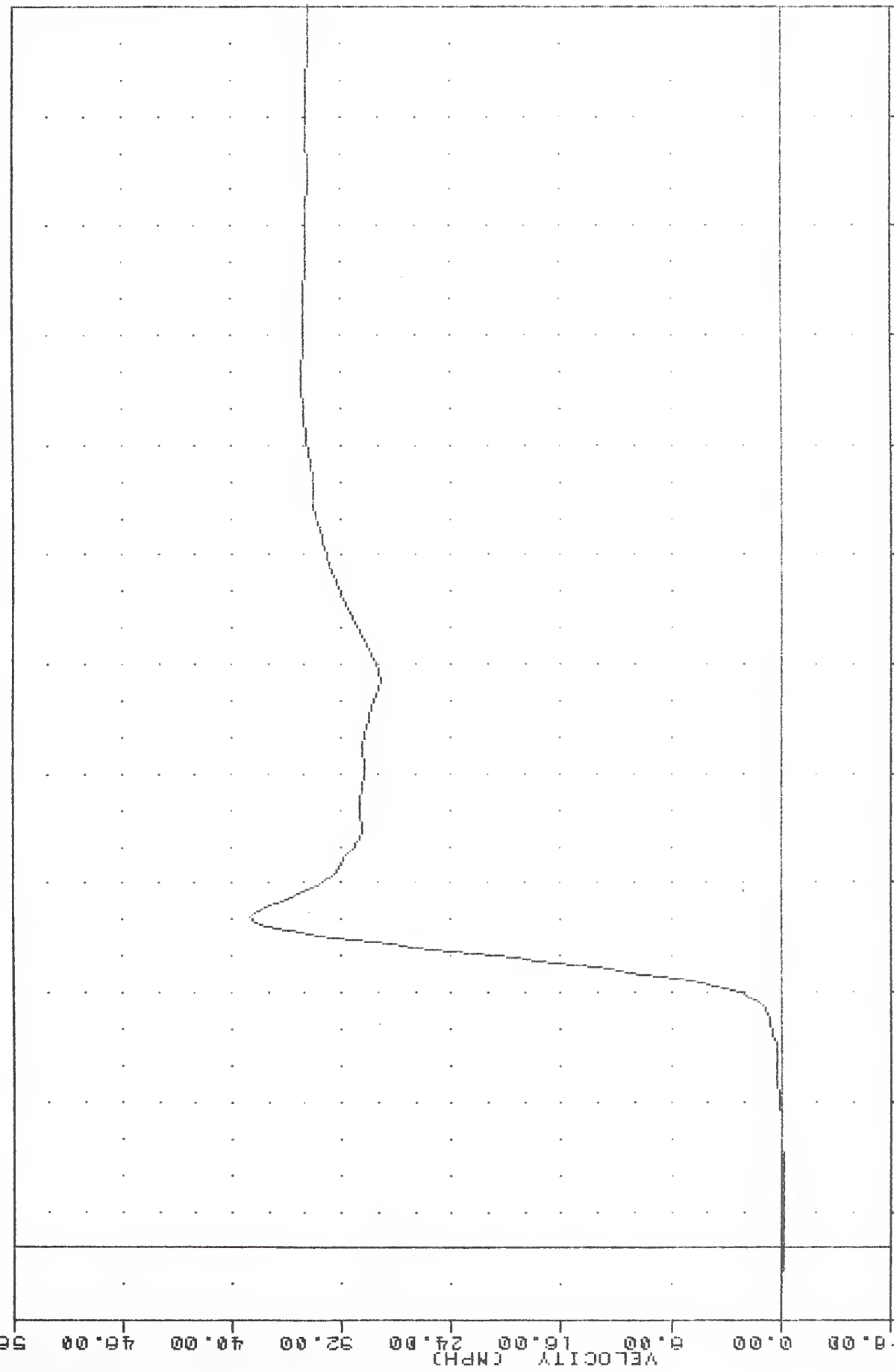
MIN. MAX VALUES = -0.138 22.50 , 36.77 e 89.38



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING T12Y63

TAC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 T12YVC

PL01 DATE 30-JUL-84 10:42:17
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -0.26 38.58 e 90.00



-8.00
 -4.00
 0.00
 8.00
 16.00
 24.00
 32.00
 40.00
 48.00
 56.00

VELOCITY (MPH)

TIME (msec)

-20.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00

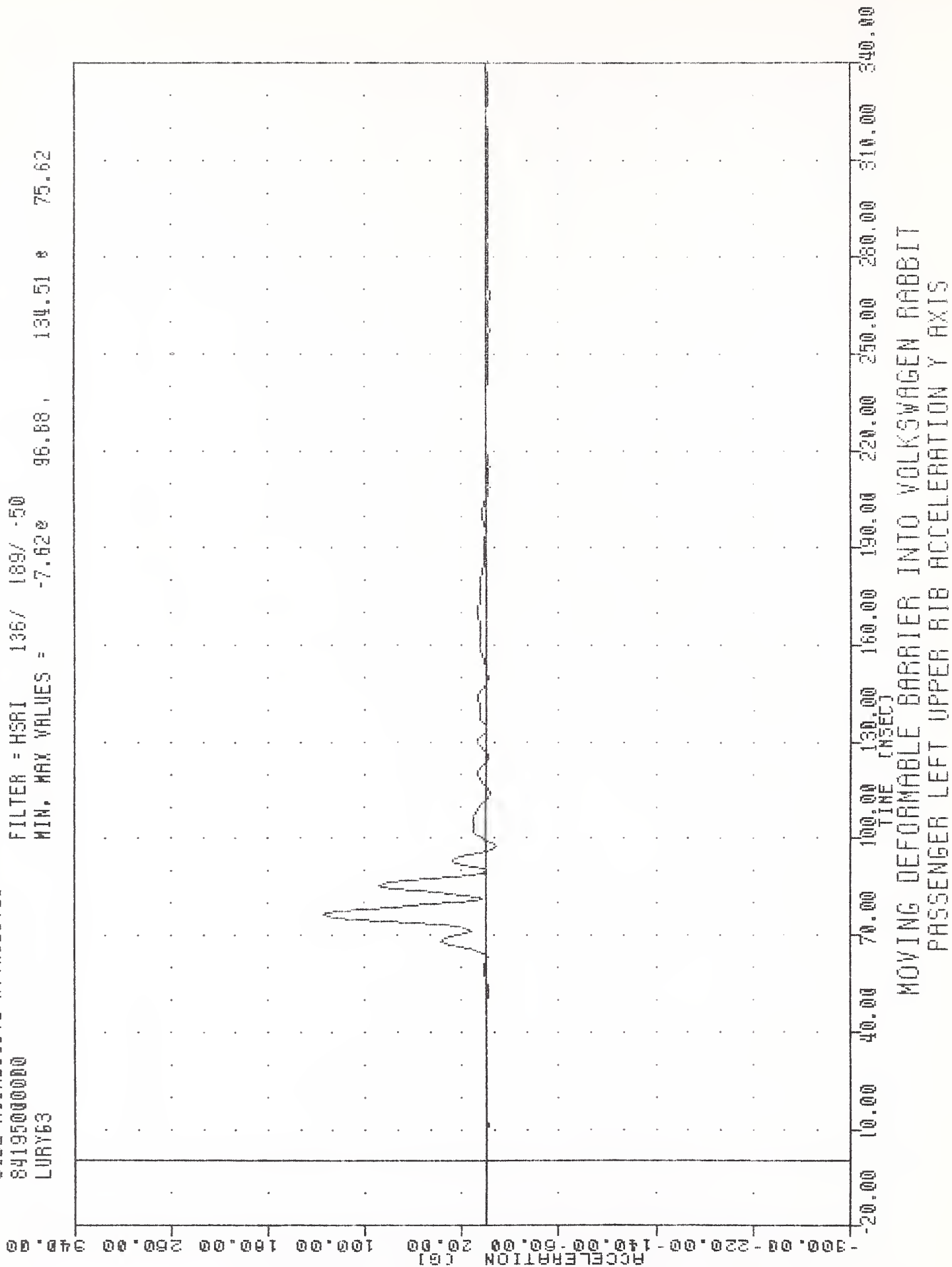
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T12YVC

TAC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 841950000000
 LURY63

PLOT DATE 30-JUL-84 10:33:42

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -7.62e 96.88, 134.51 * 75.62

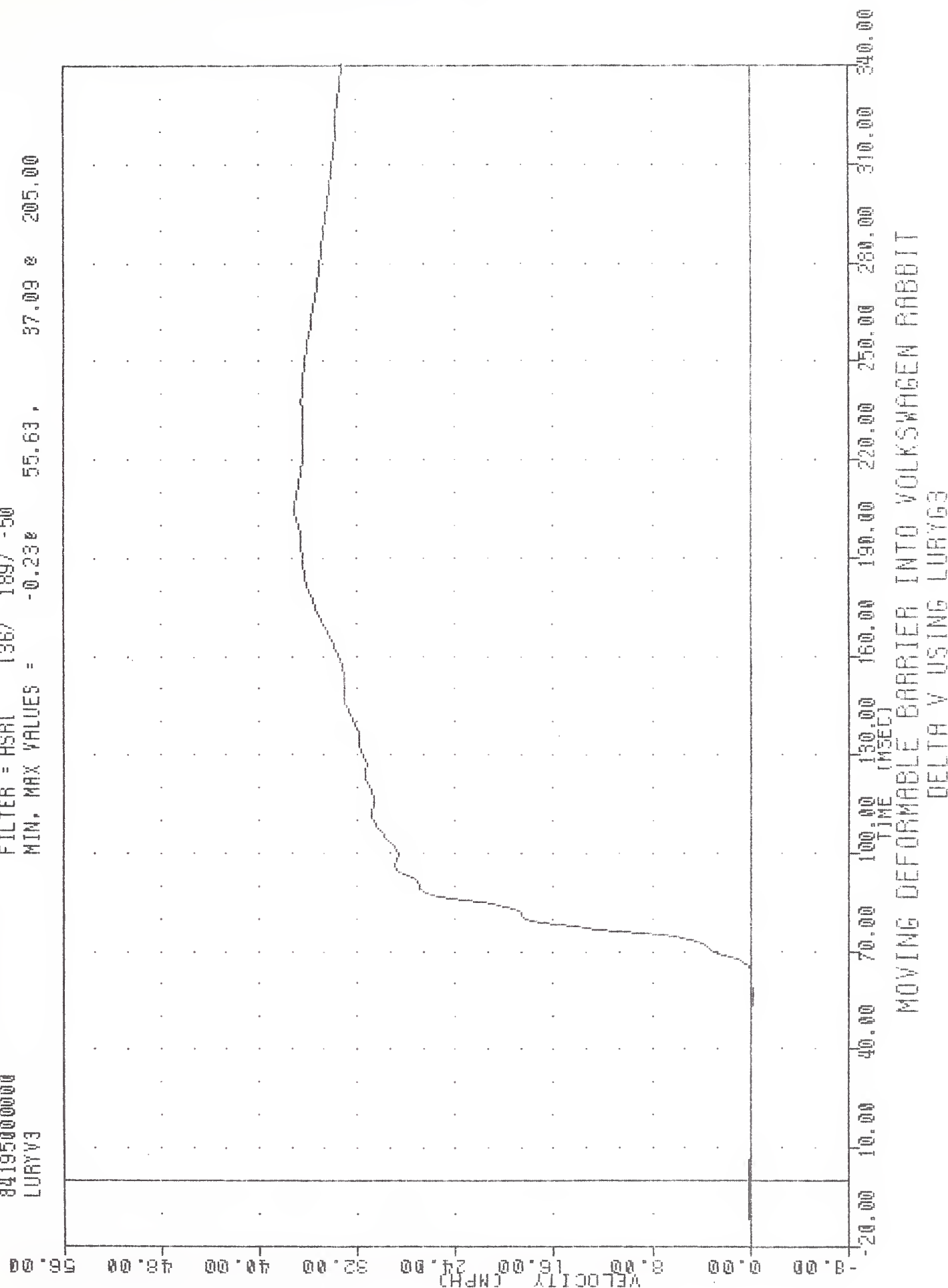


TRC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 LURYV3

PLOT DATE 30-JUL-84 10:42:17

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -0.23e 55.63, 37.09 e 205.00



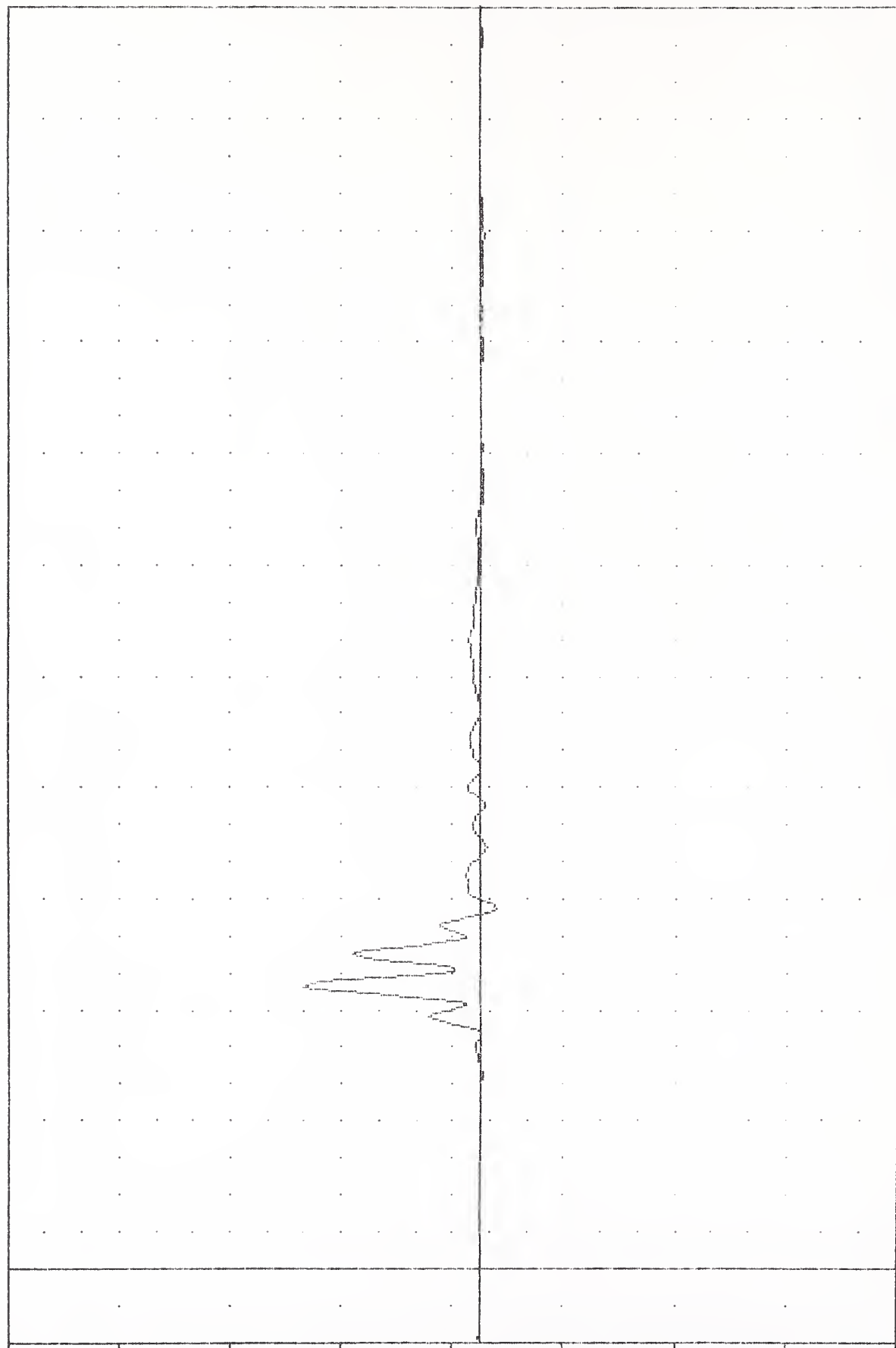
TRC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 841950000000
 LURYGC

PLOT DATE 30-JUL-84 10:33:42

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -11.49 96.88 127.51 75.62

ACCELERATION (G)



TIME (MSEC) 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00

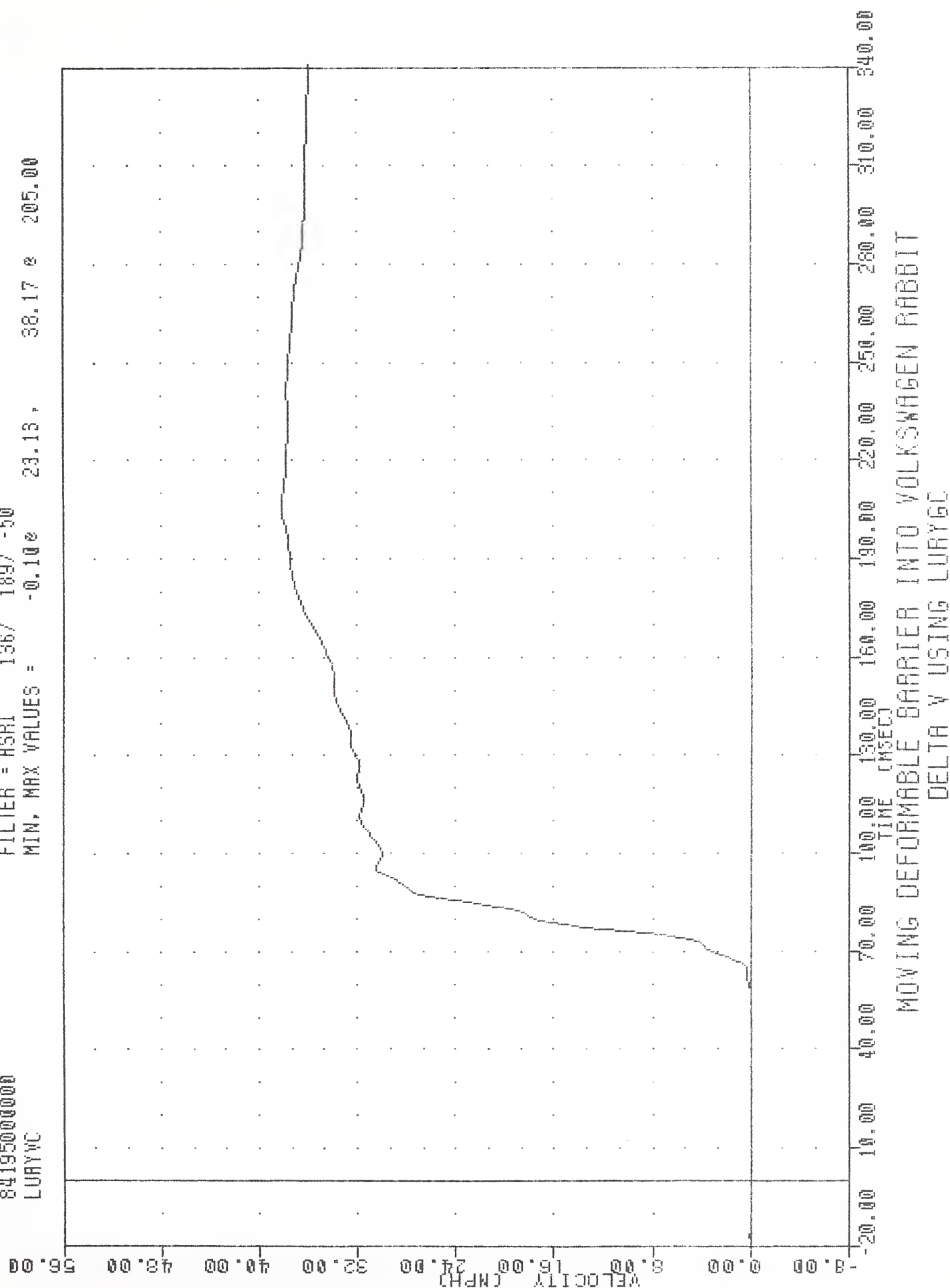
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER LEFT UPPER RIB ACCELERATION - Z Y AXIS

TAC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 LURAYC

PLOT DATE 30-JUL-84 10:42:17

FILTER = HSRI 136/ 189/ -50

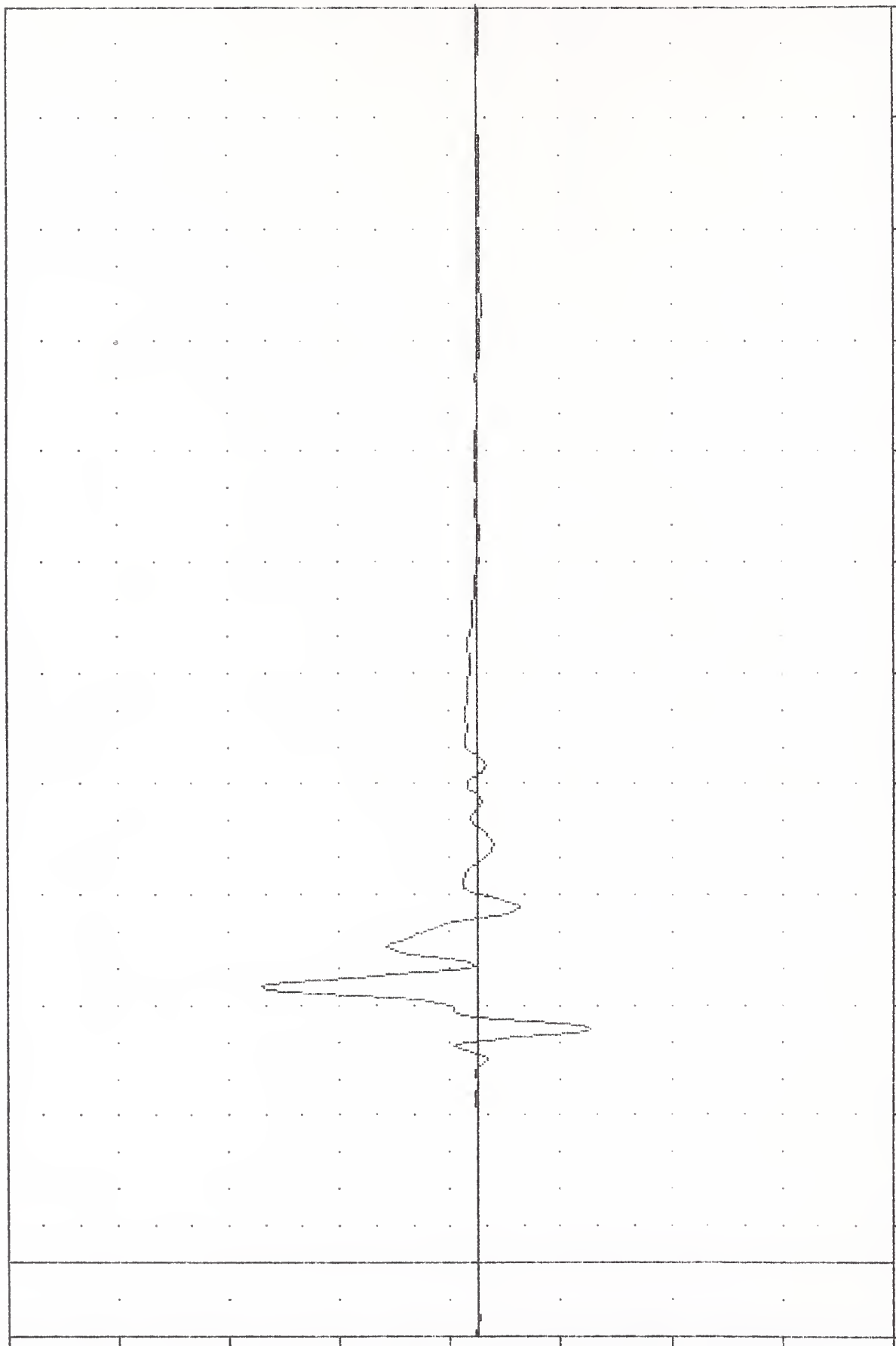
MIN, MAX VALUES = -0.10e 23.13, 38.17 e 205.00



TRC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 LLAY63

PLU DATE 30-JUL-84 10:33:42
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -82.050 63.13, 156.97 0 74.37

ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER LEFT LOWER RIB ACCELERATION Y AXIS

TRC
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 LLRYV3

PLDT DATE 30-JUL-84 10:42:17

FILTER = H3RI 136/ 189/ -50

MIN. MAX VALUES = -6.10 28.82 242.50

56.00

48.00

40.00

32.00

24.00

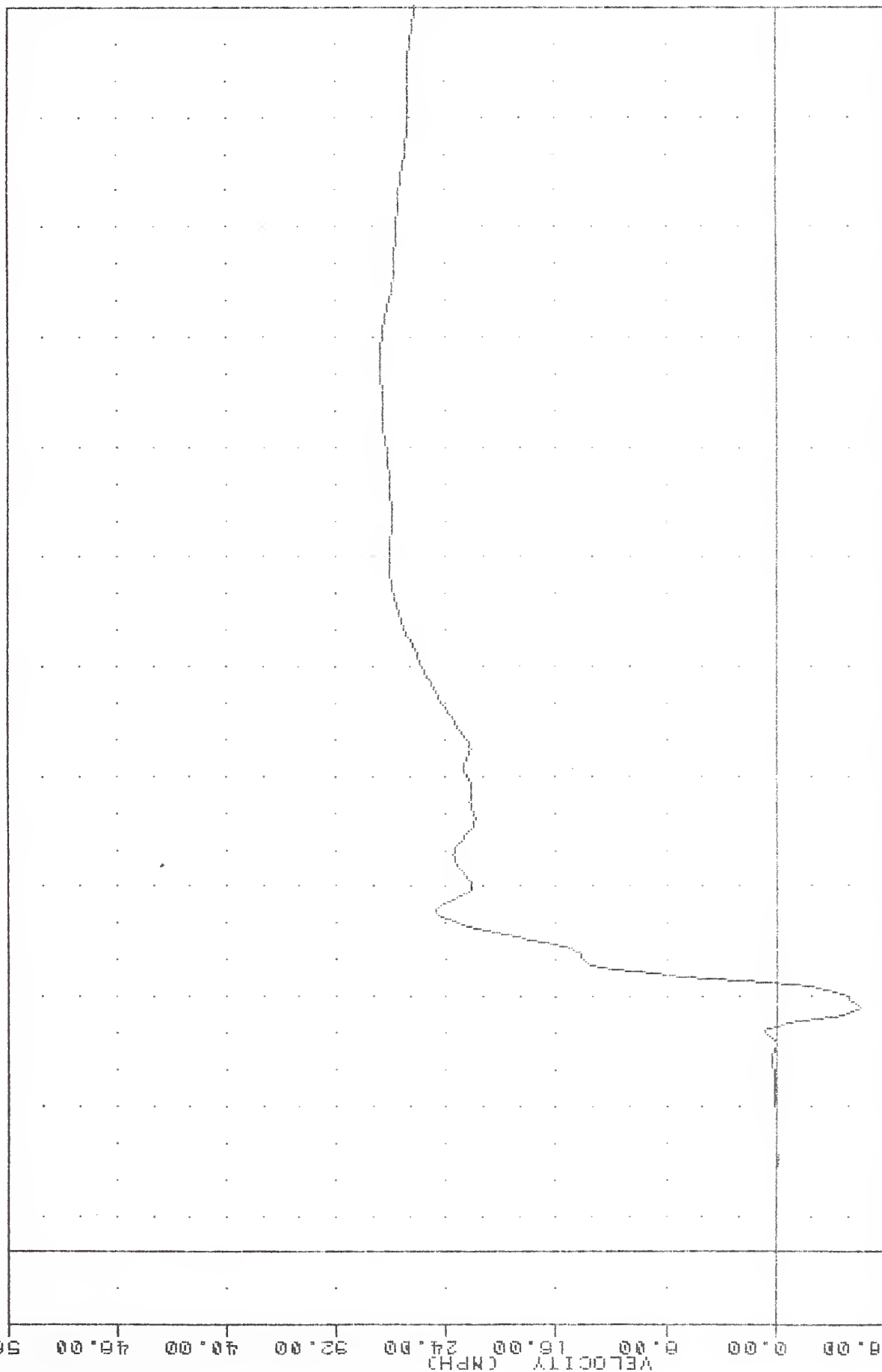
16.00

8.00

0.00

-8.00

B-61



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LLRYG3

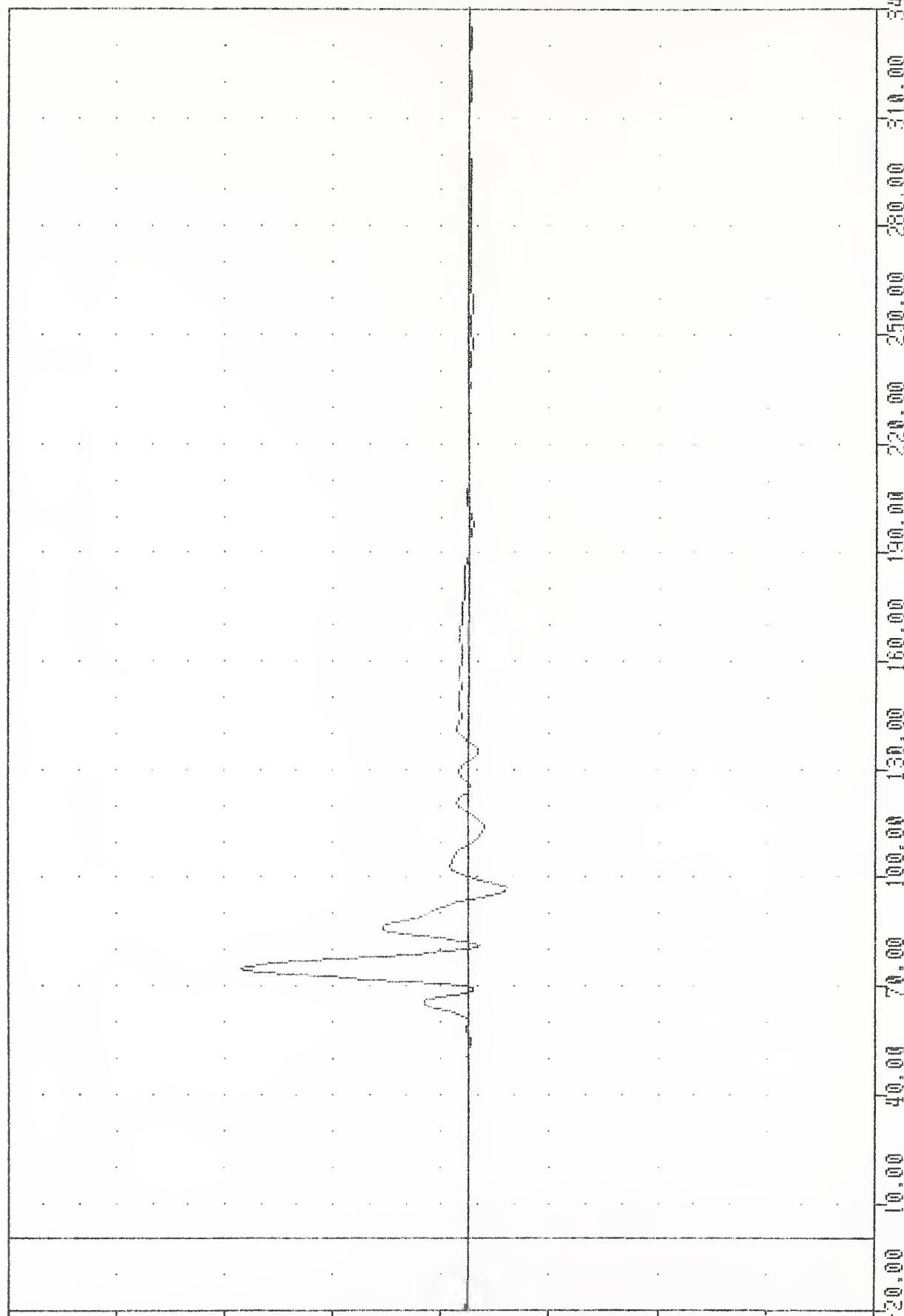
TAL , 84W/13
 SIDE AGGRESSIVE ATTRIBUTES
 841950000000
 LLRY6C

PLU1 DATE 30-JUL-84 10:33:42

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -27.970 96.25 , 168.66 0 74.37

ACCELERATION [G]



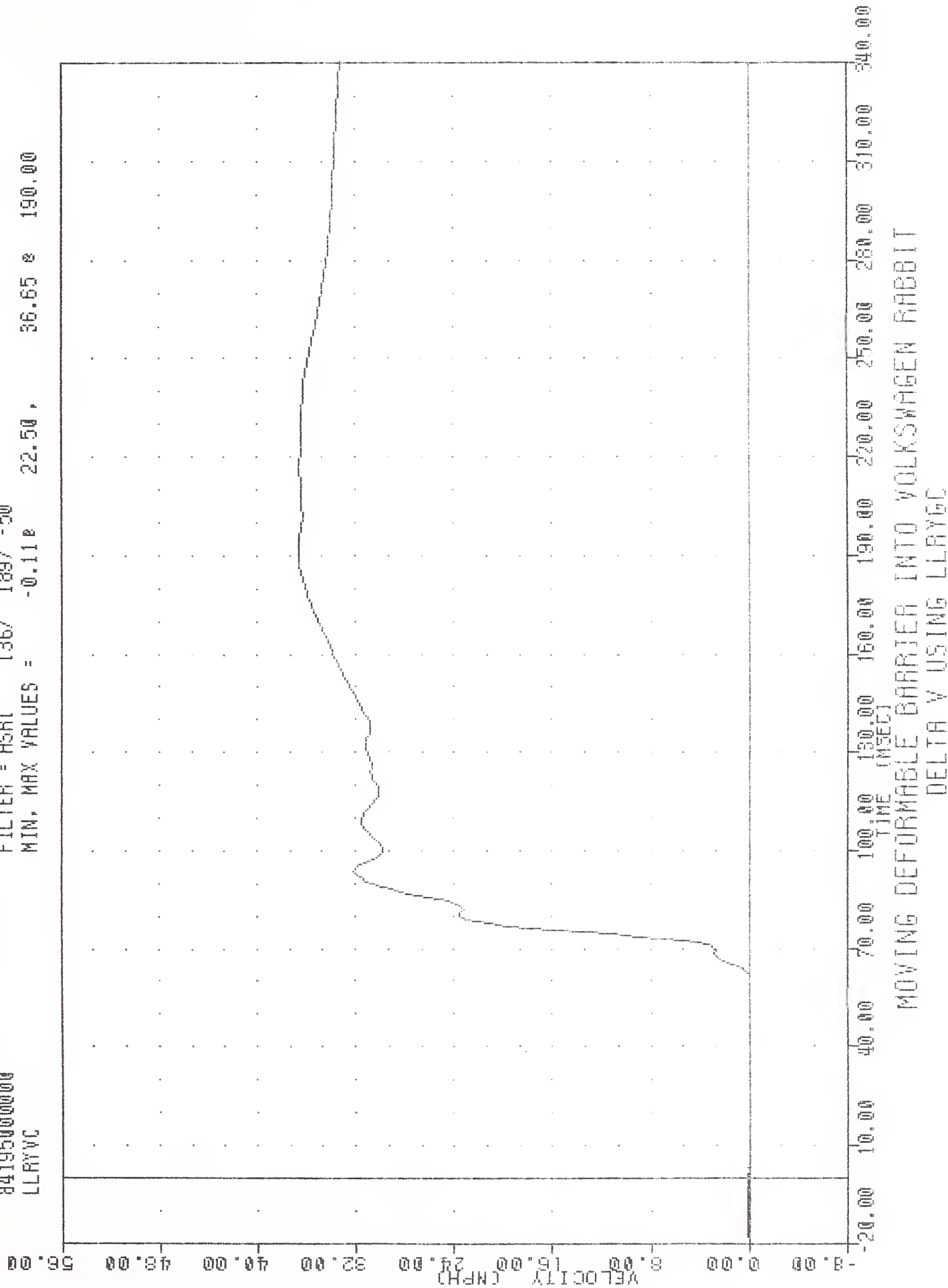
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER LEFT LOWER RIB ACCELERATION #2 Y AXIS

TRC 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 LLYVC

PLU1 DATE 30-JUL-84 10:42:17

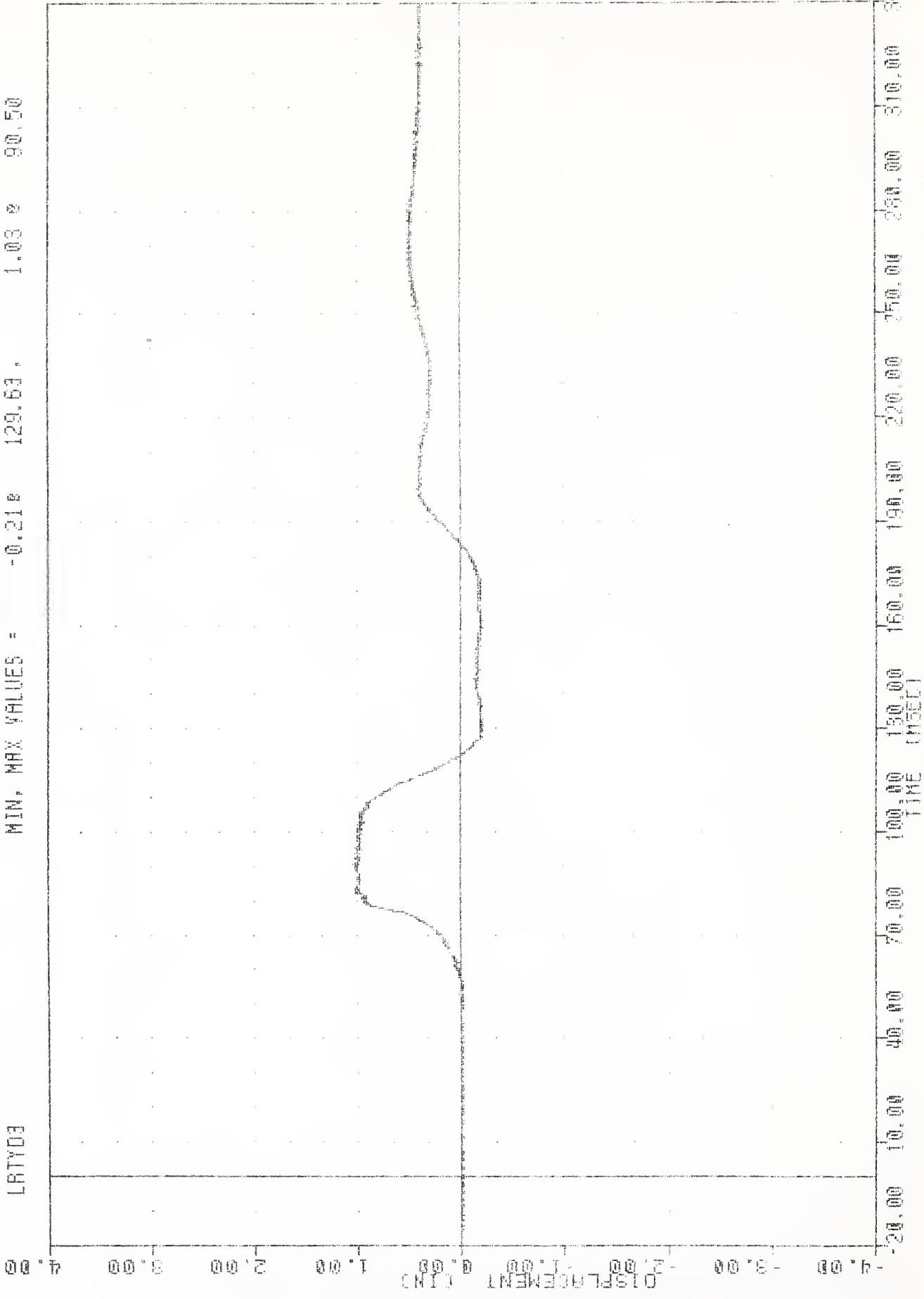
FILTER = HSR1 136/ 189/ -50

MIN, MAX VALUES = -0.11e 22.50, 36.65 e 190.00



TRC 840713
 SIDE AGGRESSIVE ATTRIBUTES
 04195000000
 LRTYD3

PLU1 DATE 13-AUG-84 14:18:20
 FILTER = ALPF 1650/ 5217/ -40
 MIN, MAX VALUES = -0.218 129.63, 1.03 90.50



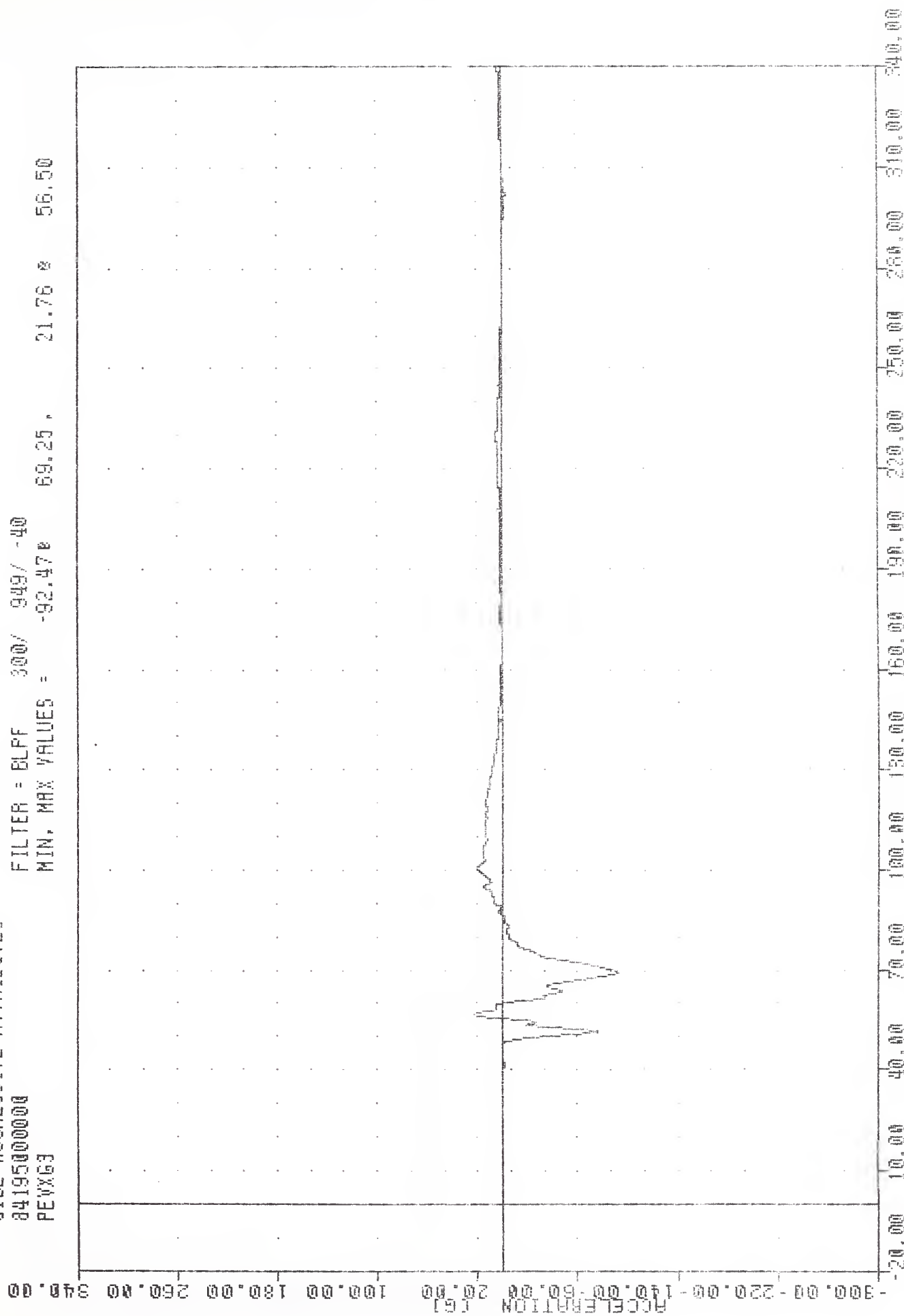
MOVING DEFORMABLE BARRIER INTO VOLSWAAGEN RABBIT
 PASSENGER LEFT RIB TO SPINE DISPLACEMENT INCHES

THC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 PEVX63

PLUI DATE 13-HUG-84 14:18:20

FILTER = BLFF 300/ 949/ -40

MIN, MAX VALUES = -92.470 69.25, 21.76 56.50

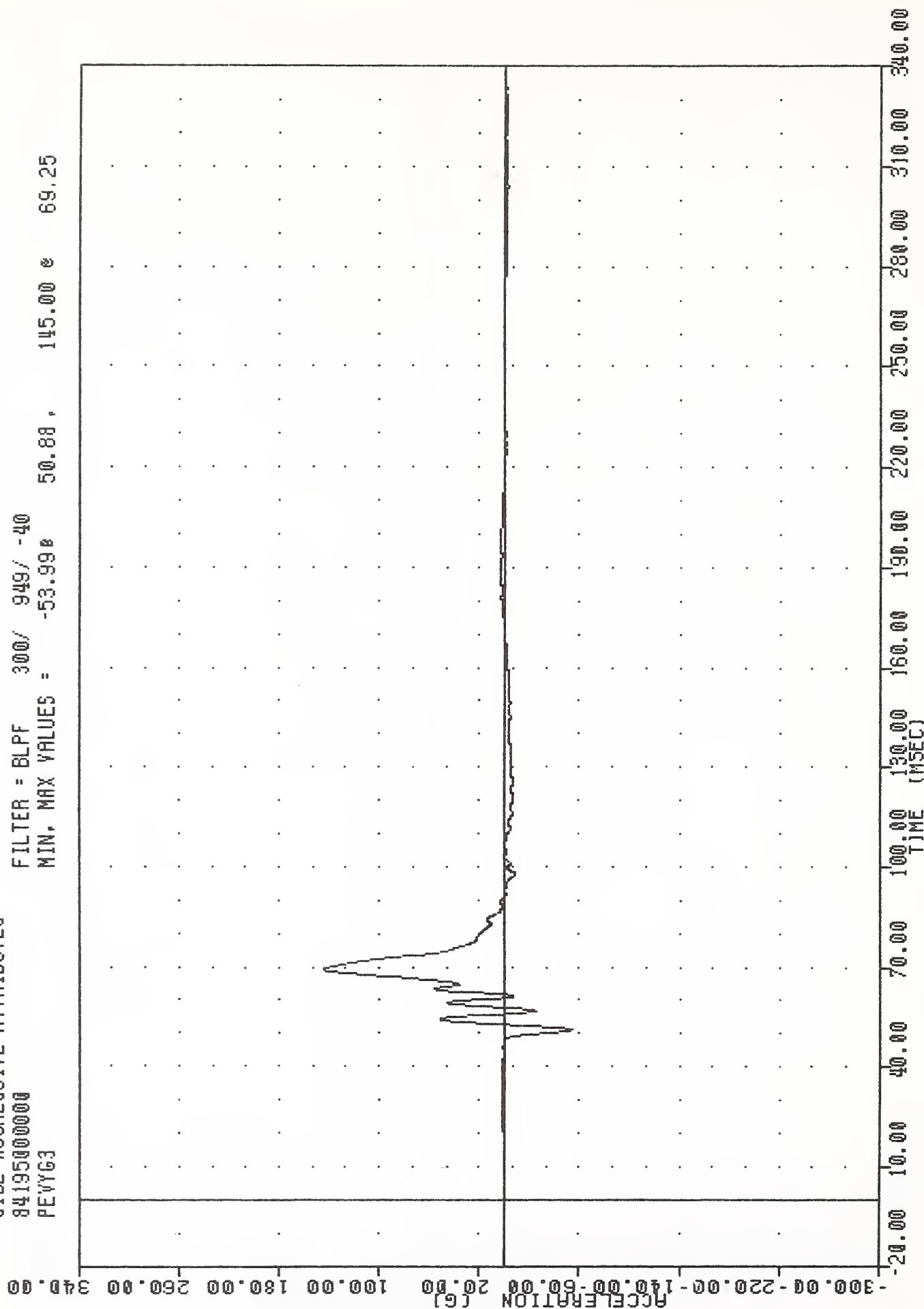


INL 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 PEVYG3

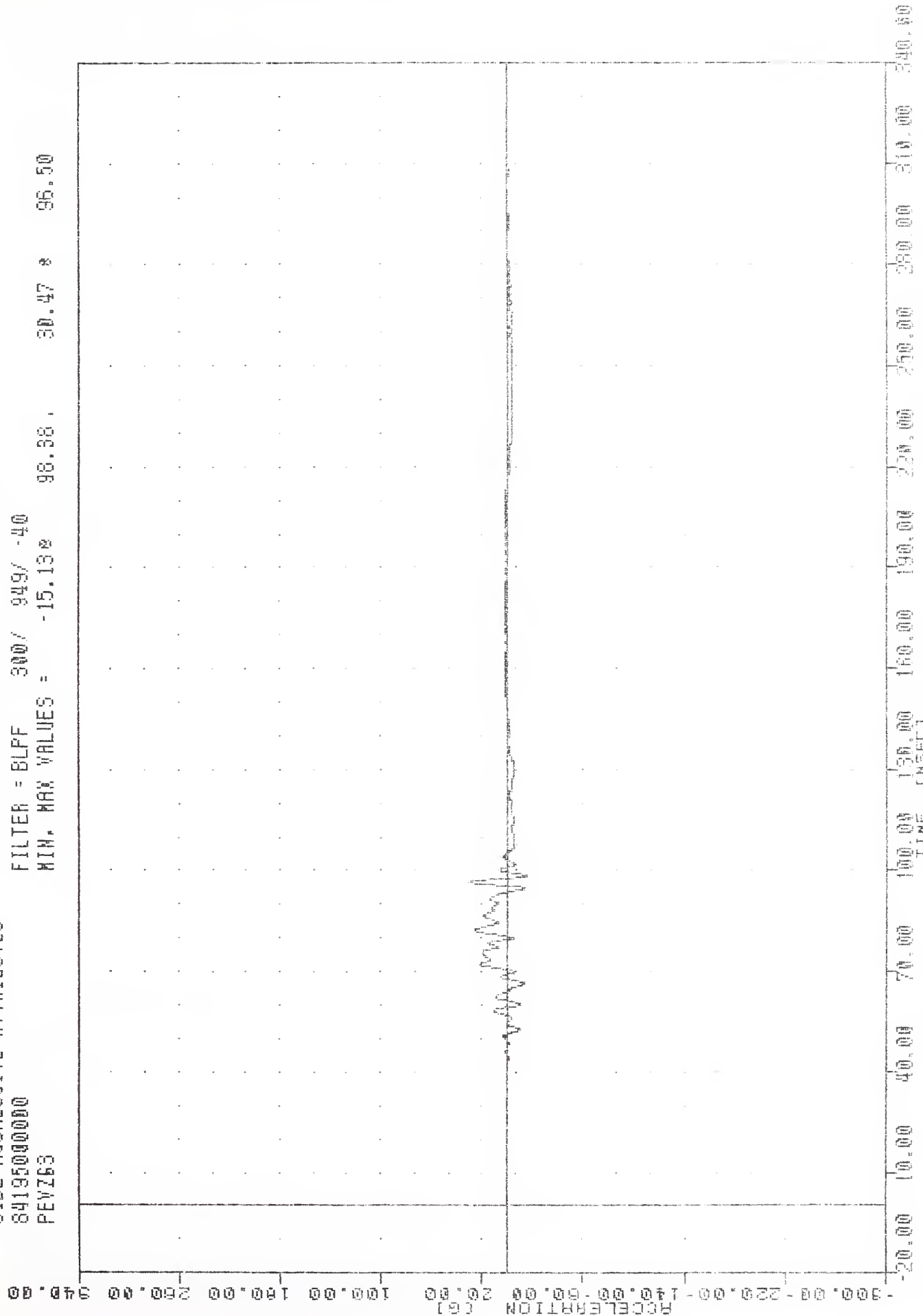
PLU1 UNIE 14-MUG-84 12:10:24

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -53.998 50.88, 145.00 69.25



INC * 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 PEVZ63
 PLU1 DATE 13-MUG-84 14:18:20
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -15.13 98.98 30.47 * 96.50



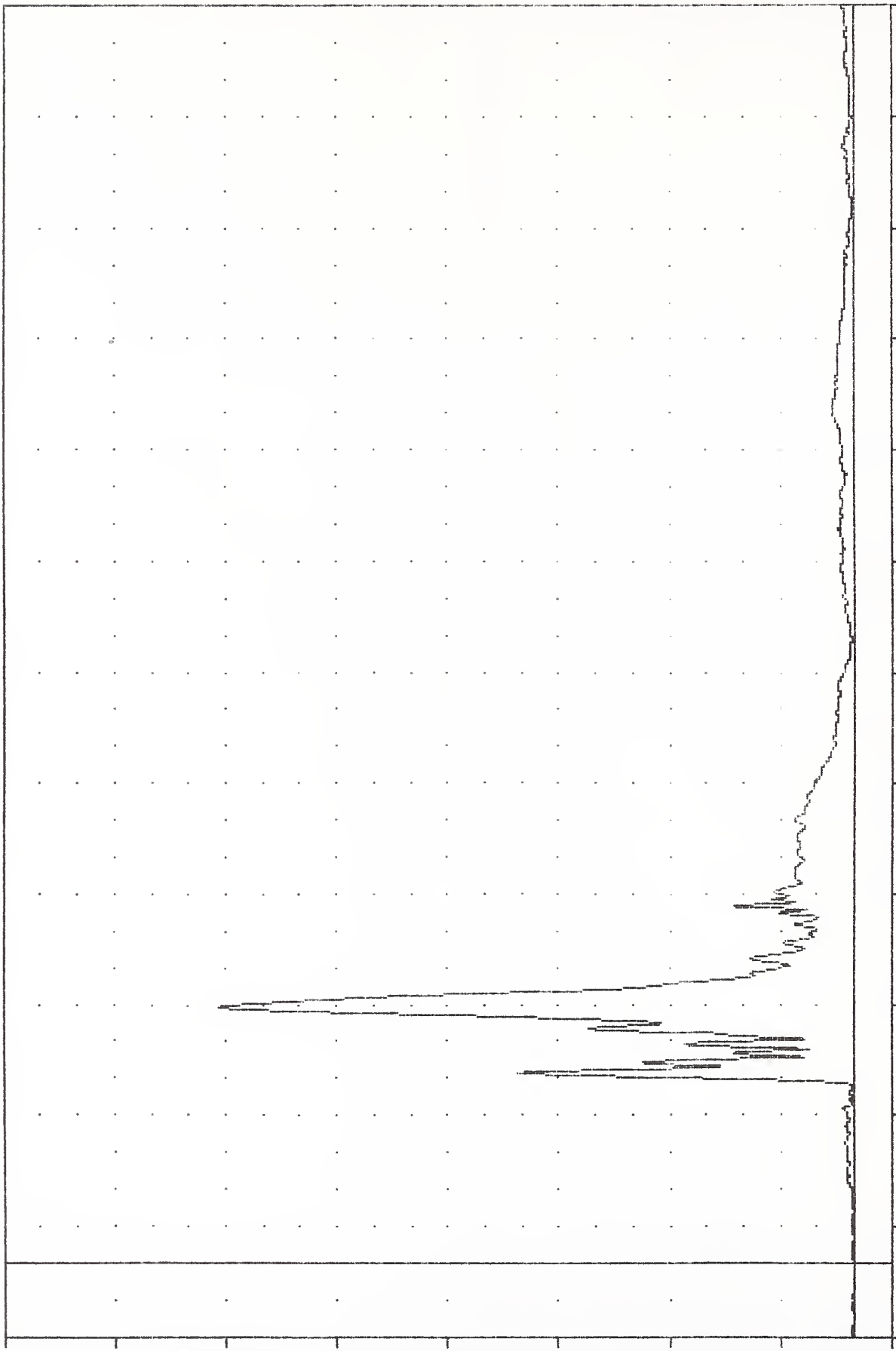
TRC , 840713
SIDE AGGRESSIVE ATTRIBUTES
84195000000
PEVRG3

PLOT DATE 30-JUL-84 11:17:16

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = 0.10e -7.38 , 171.98 e 69.25

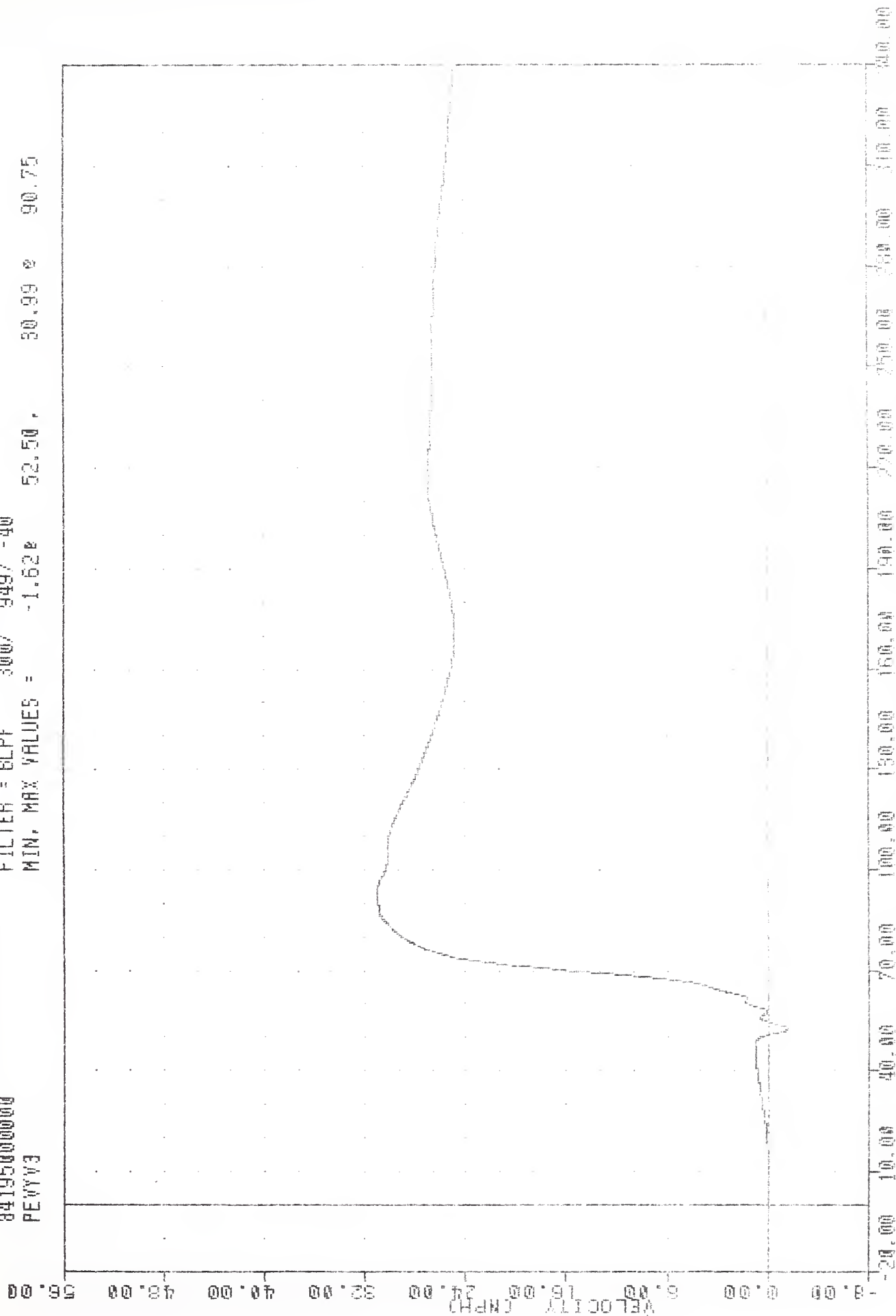
ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER PELVIS RESULTANT

TRC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 841950000000
 PEVYV3

PLU1 DATE 13-RUG-84 14:15:43
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -1.62E 52.50 30.99 E 90.75



MOVING DEFORMABLE BARRIER INTO VULCANIZING TOWER
 DELTA V USING PEVYV3

SIDE AGGRESSIVE ATTRIBUTES

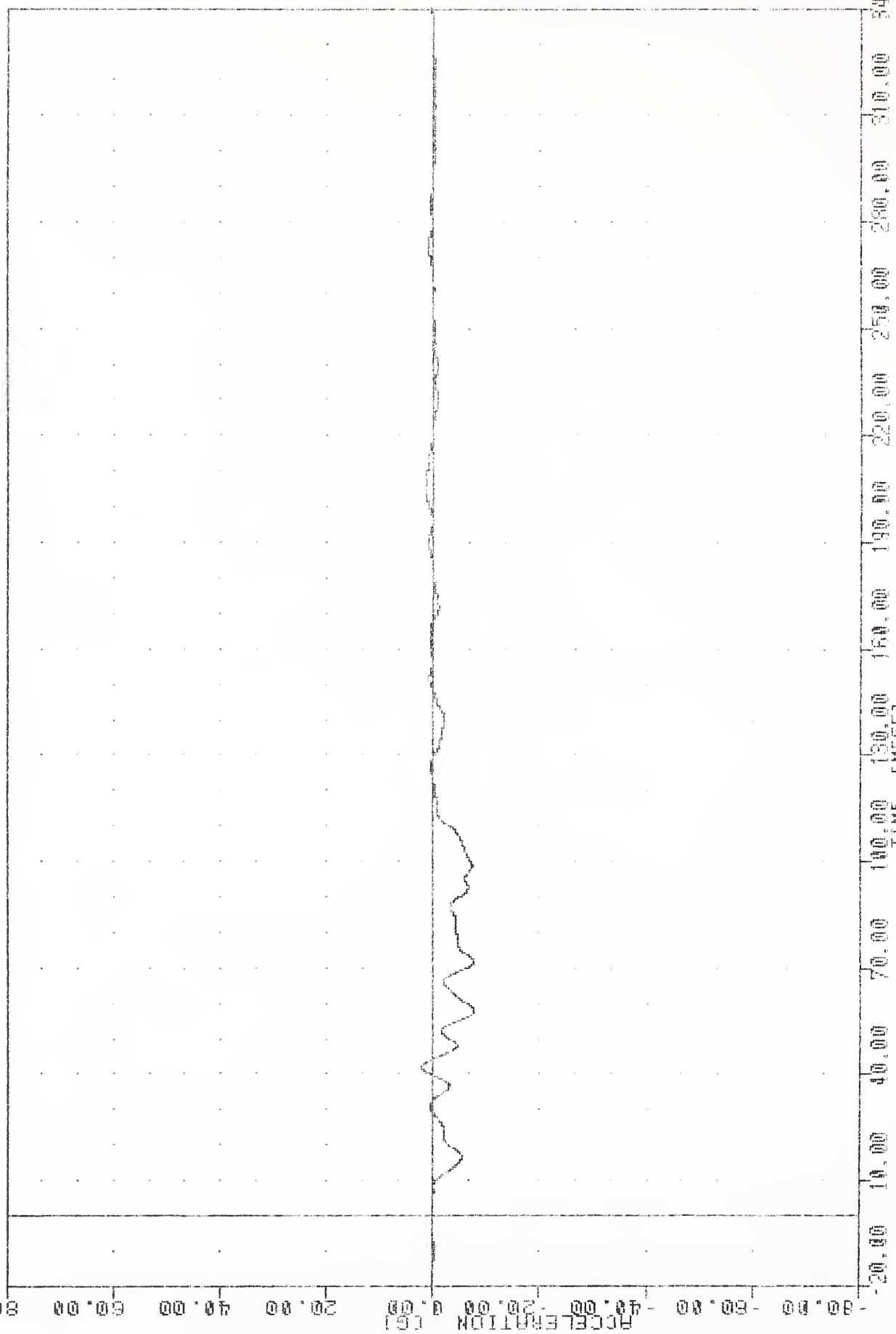
841950000000

RFSXG1

FILTER = BLFF 100/ 316/ -40

MIN. MAX VALUES = -7.698

57.63 2.17 41.75



MOVING DEFORMABLE CHARTER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT FRONT STILL ACCELERATION X AXIS

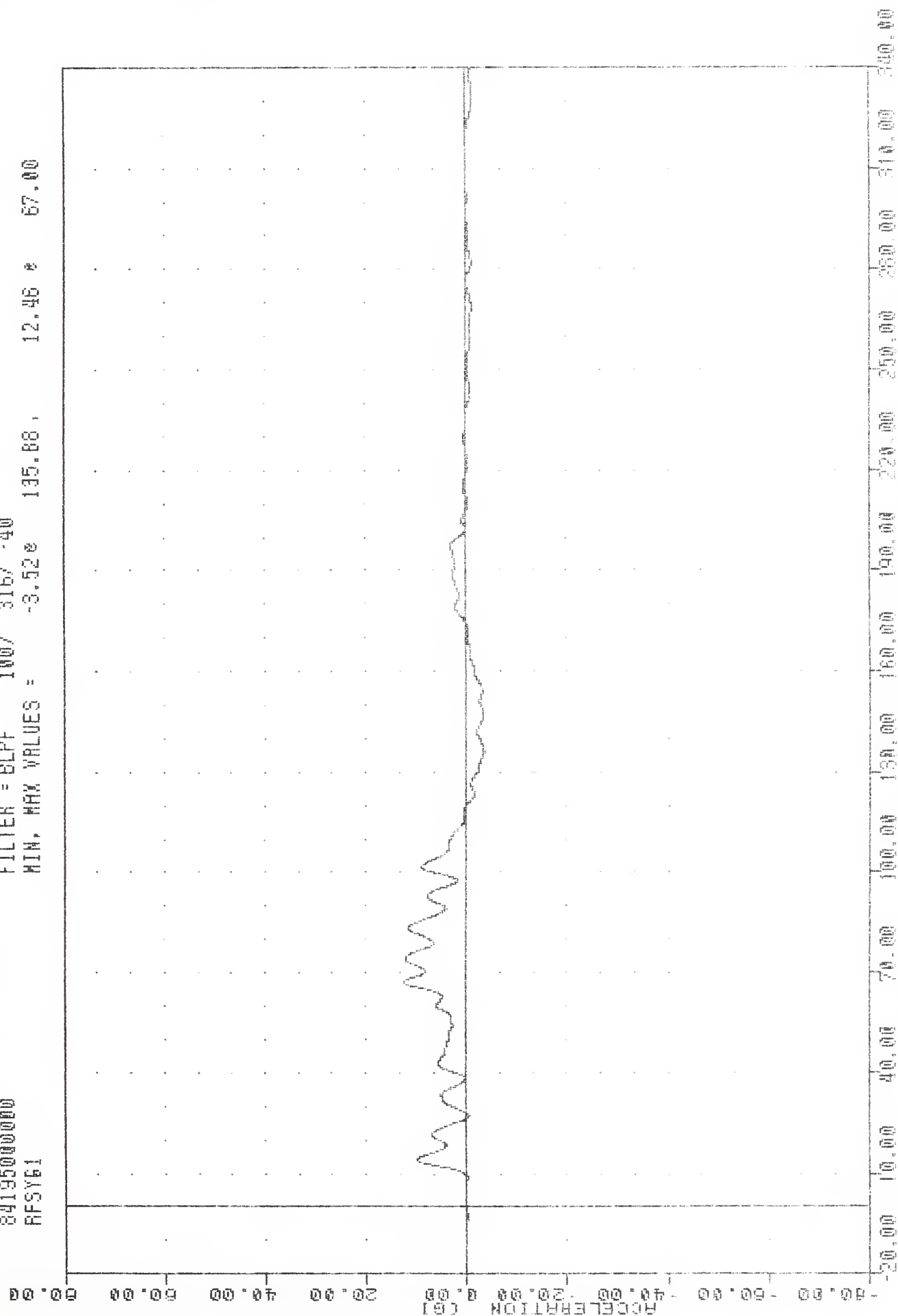
SIDE AGGRESSIVE ATTRIBUTES

84195000000

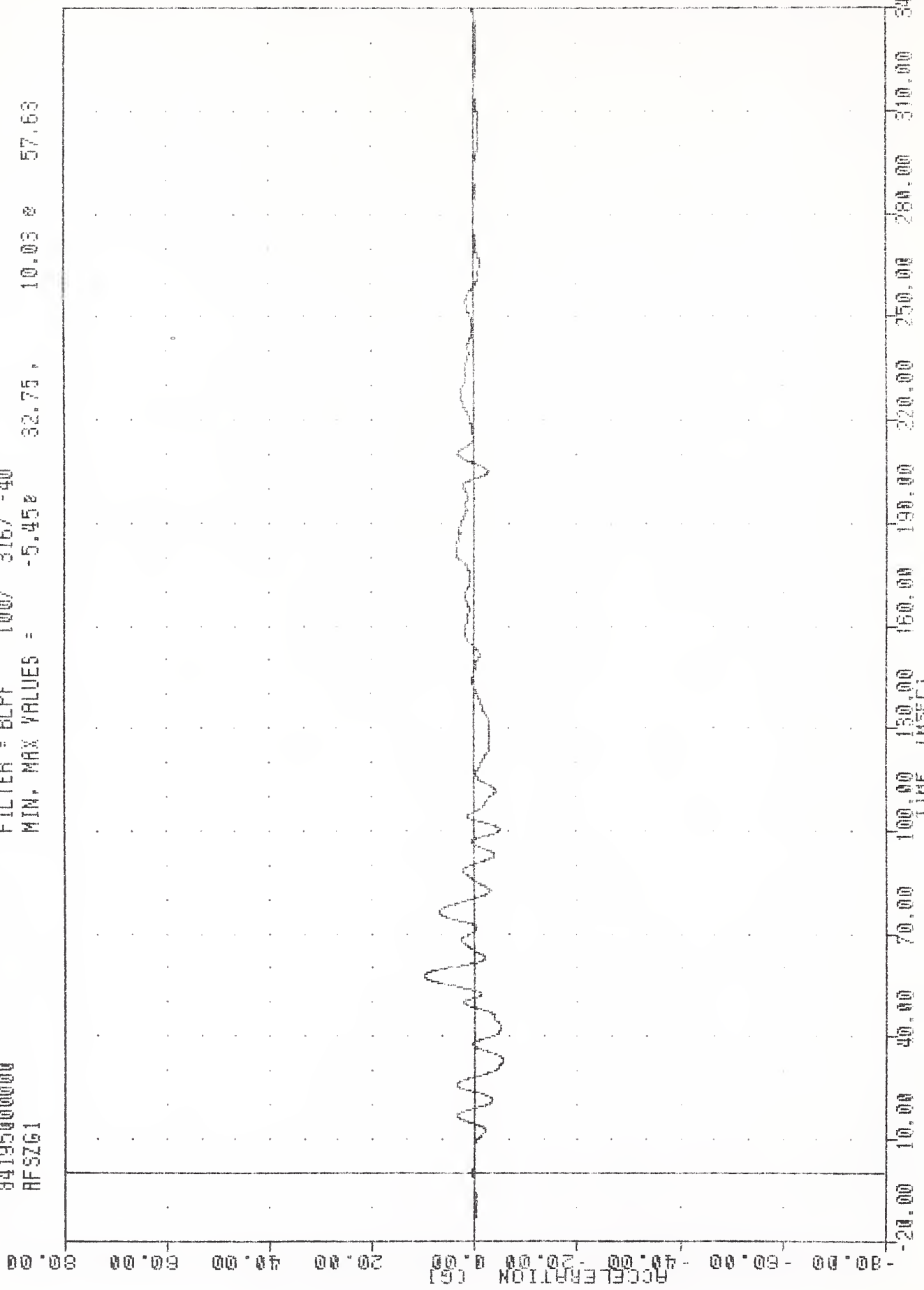
RFSY61

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -3.520 135.88 , 12.46 * 67.00



IRC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 AFSZG1
 PDU DATE 13-HUG-84 14:18:20
 FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -5.450 32.75, 10.03 0 57.63



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 VEHICLE RIGHT FRONT STILL ACCELERATION Z AXIS

TRC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 RFSRG1

PLU1 DATE 30-JUL-84 11:17:10

FILTER = 8LPF 100/ 316/ -40

MIN. MAX VALUES = 0.03e 294.25 , 14.26 e 74.63

70.00

60.00

50.00

40.00

30.00

20.00

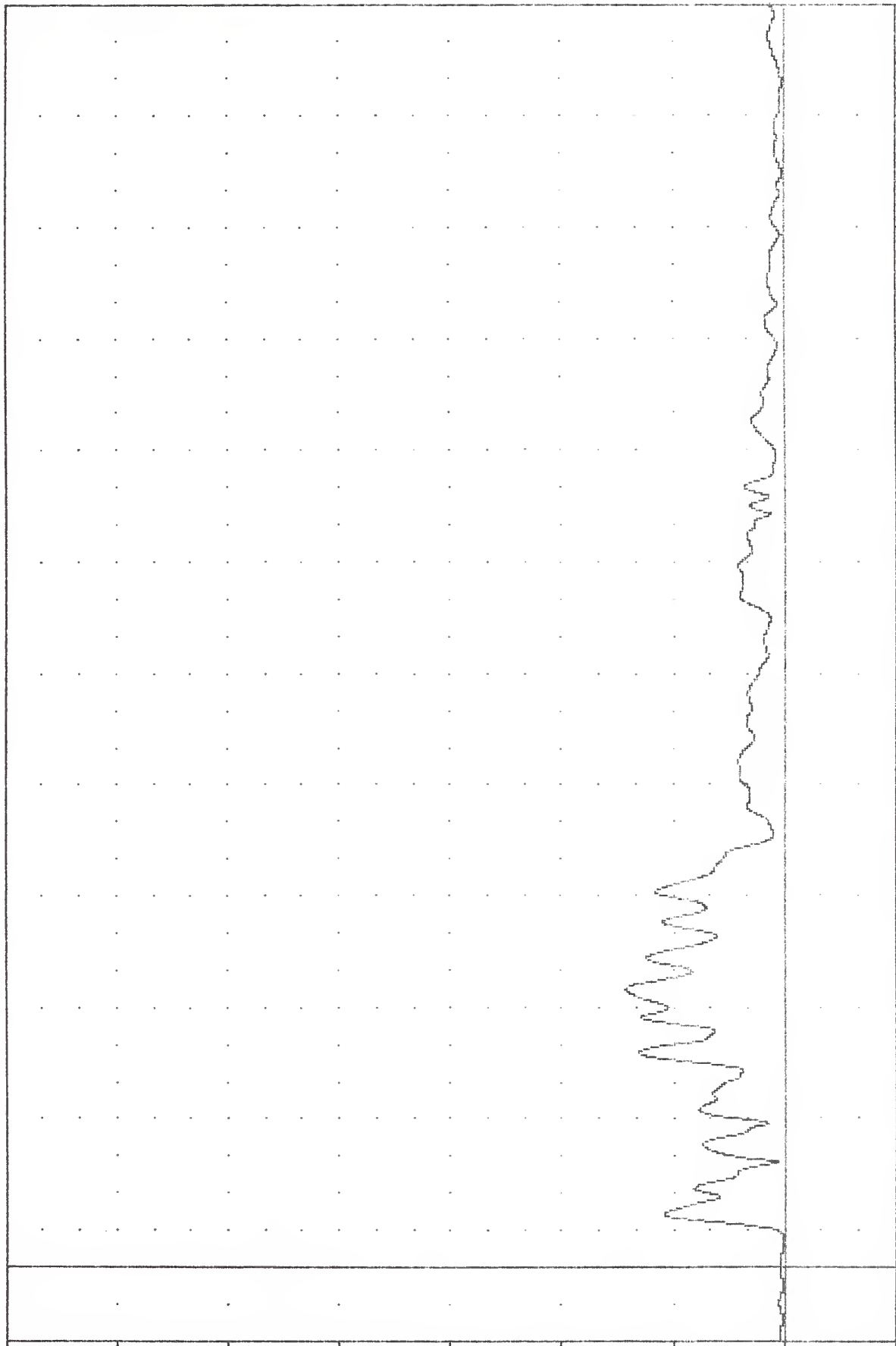
10.00

0.00

-10.00

-20.00

ACCELERATION (G)



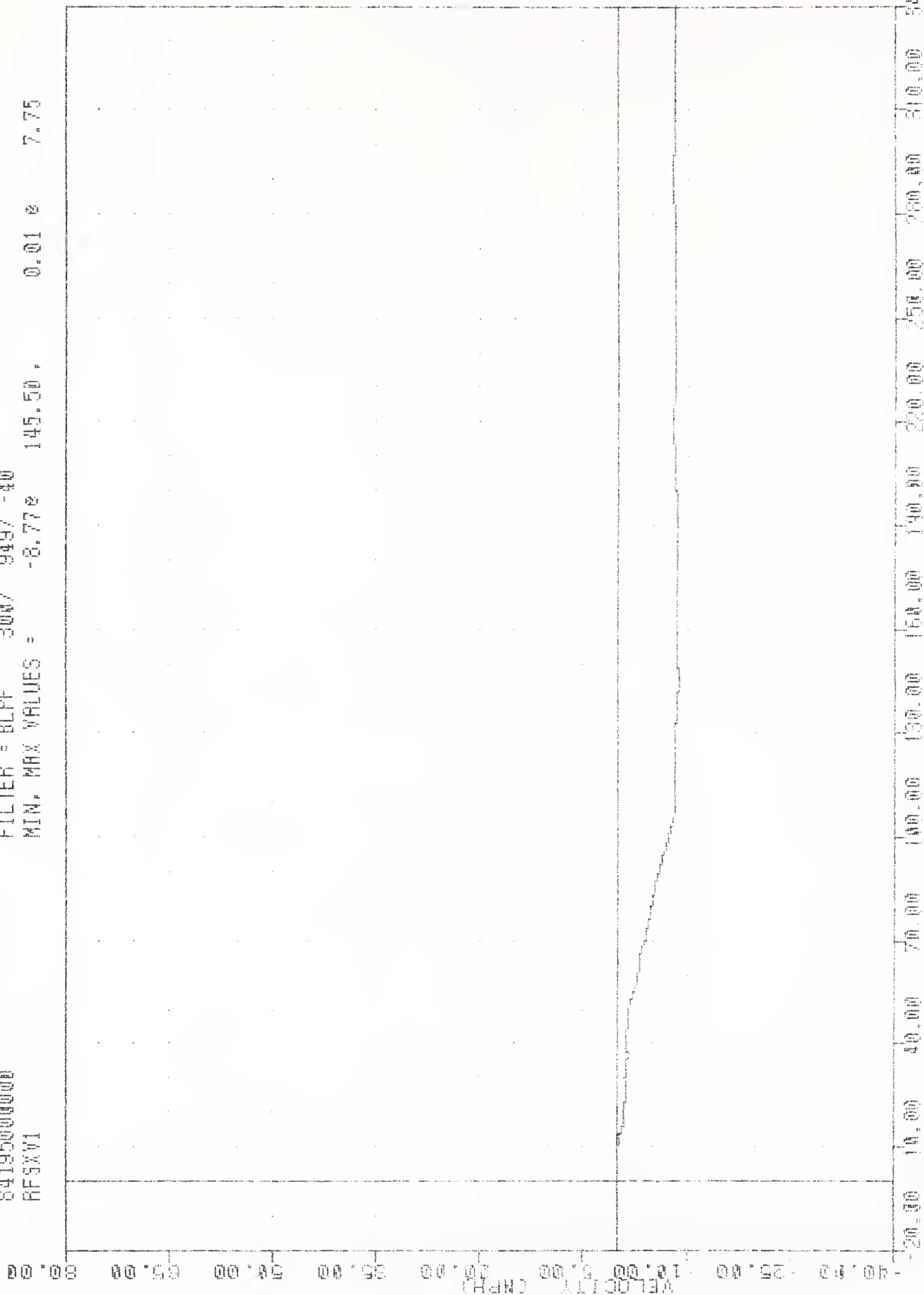
TIME (msec) 0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 VEHICLE RIGHT FRONT SILL RESULTANT

IRL , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 RFSXV1

PLOT DATE 13-AUG-84 14:15:45

FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -8.77e 145.50 , 0.01 e 7.75



MOVING DETECTABLE BURSTED INTO VOLCANIC EARTHQUAKE
 DELTA V USING RFSXV1

SIDE AGGRESSIVE ATTRIBUTES

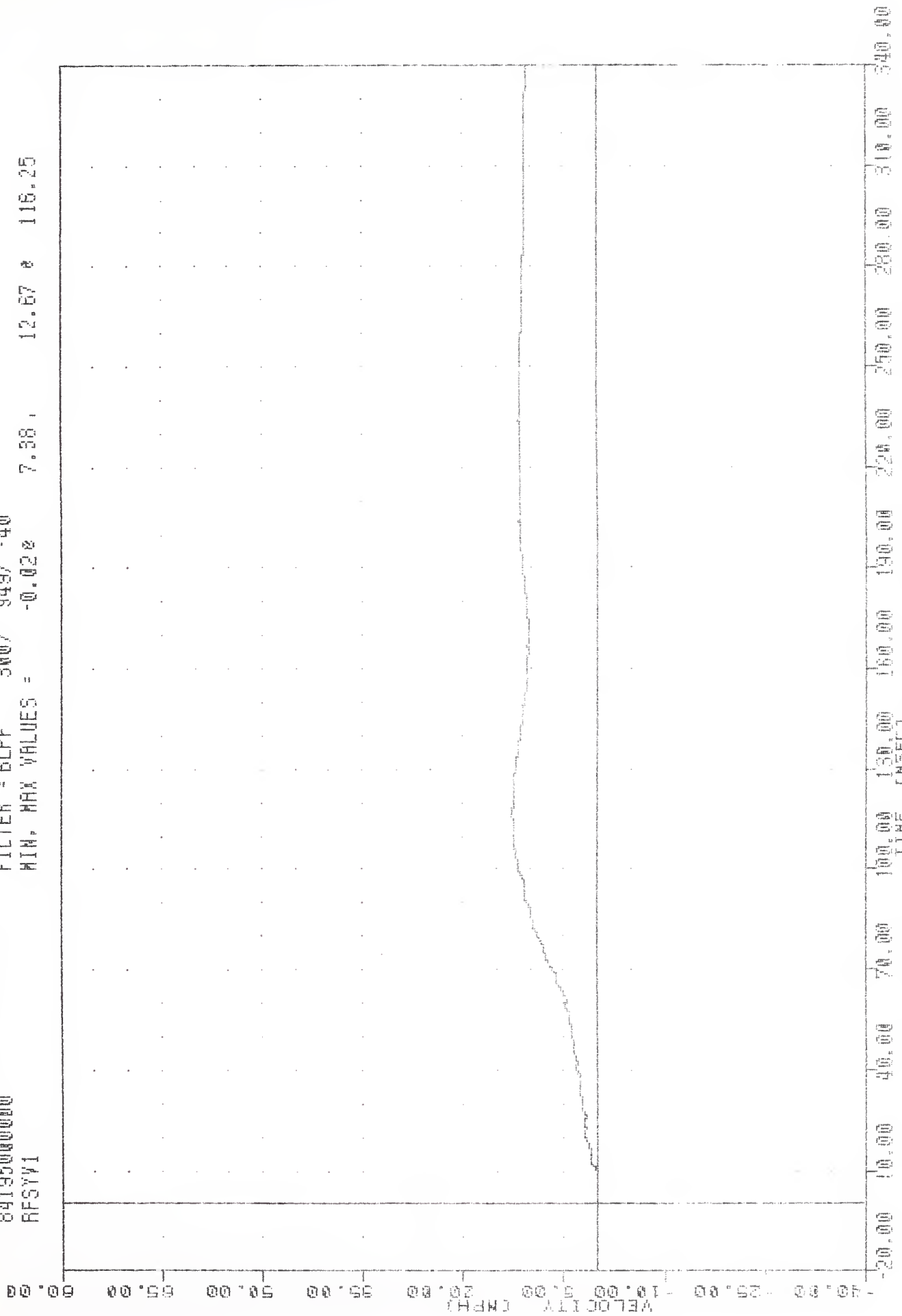
841950000000

RFSYV1

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -0.028

7.38 , 12.67 & 116.25

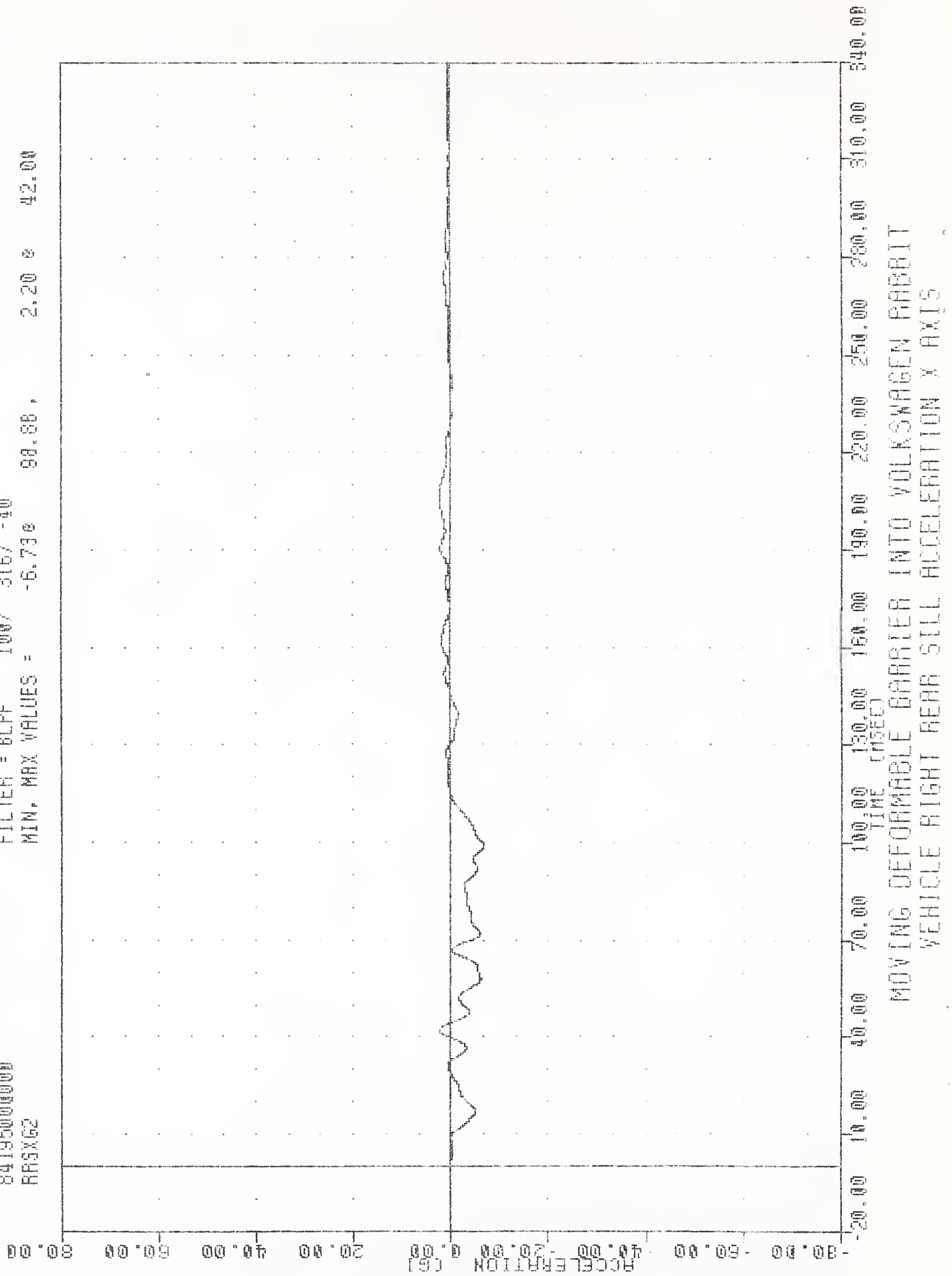


TRC , 840713
SIDE AGGRESSIVE ATTRIBUTES
84195000000
RRSX62

PLU1 DATE 13-AUG-84 14:18:20

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -6.73e 98.88, 2.20 e 42.00

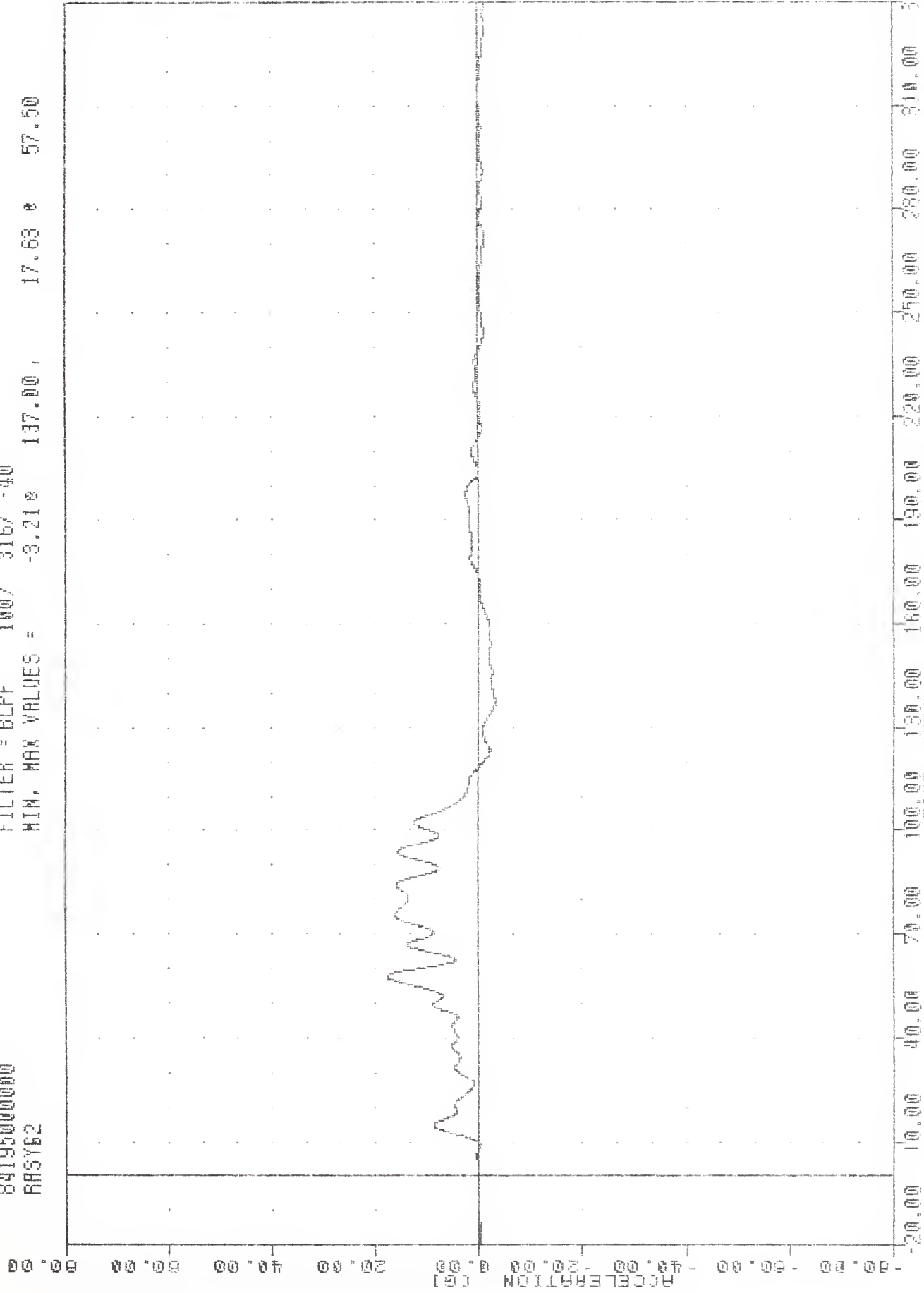


TRC 840713
 SIDE AGGRESSIVE ATTRIBUTES
 841950000000
 RASY62

PLU1 DATE 13-HUG-84 14:18:20

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -3.21e 137.00, 17.63 e 57.50



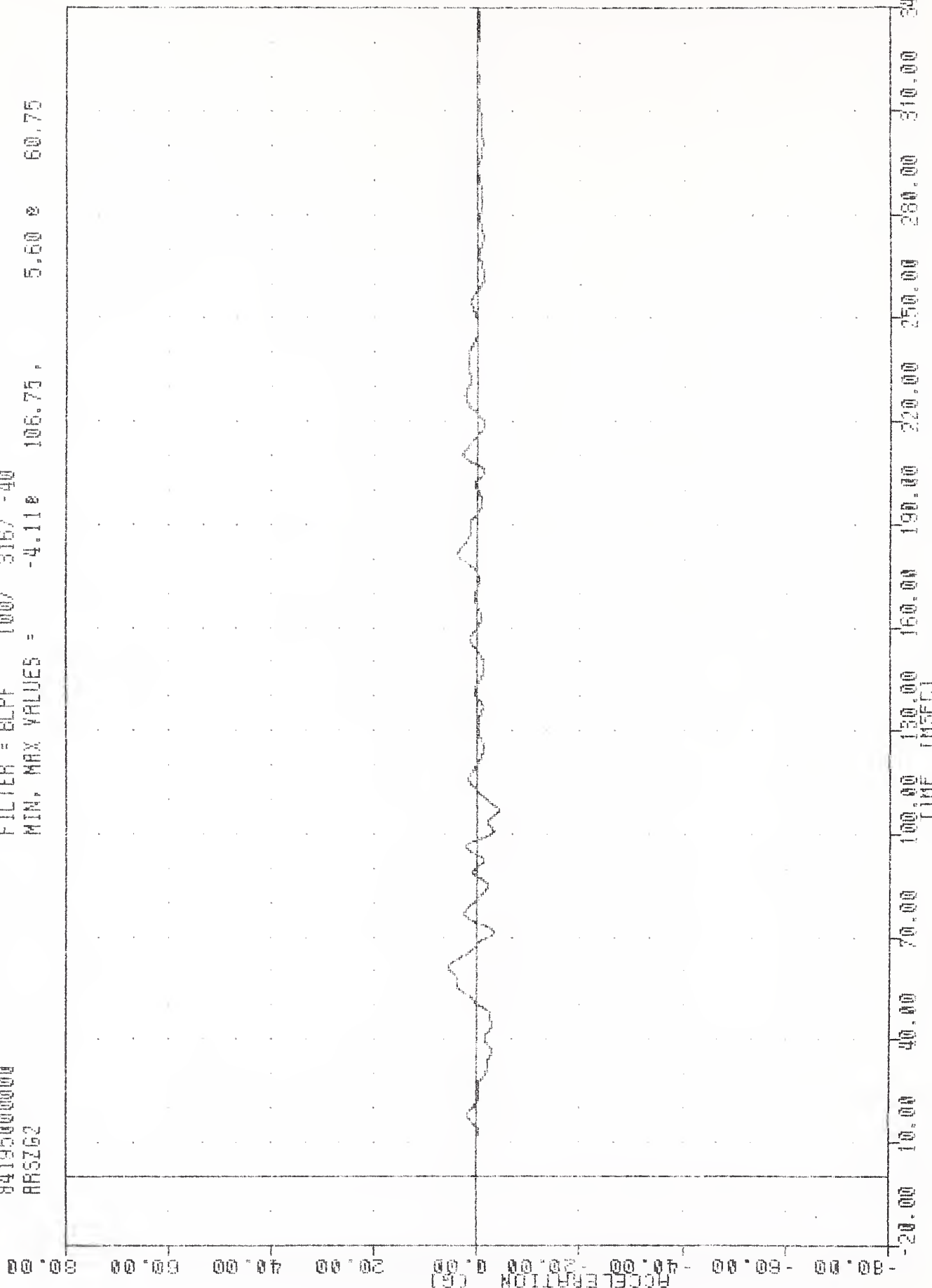
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN ROBBT
 VEHICLE RIGHT REAR SILL ACCELERATION Y AXIS

IRC , 840713
SIDE AGGRESSIVE ATTRIBUTES
84195000000
RRSZ62

PLOT DATE 13-HUG-84 14:18:20

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -4.118 106.75, 5.60 60.75



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT REAR SILL ACCELERATION Z AXIS

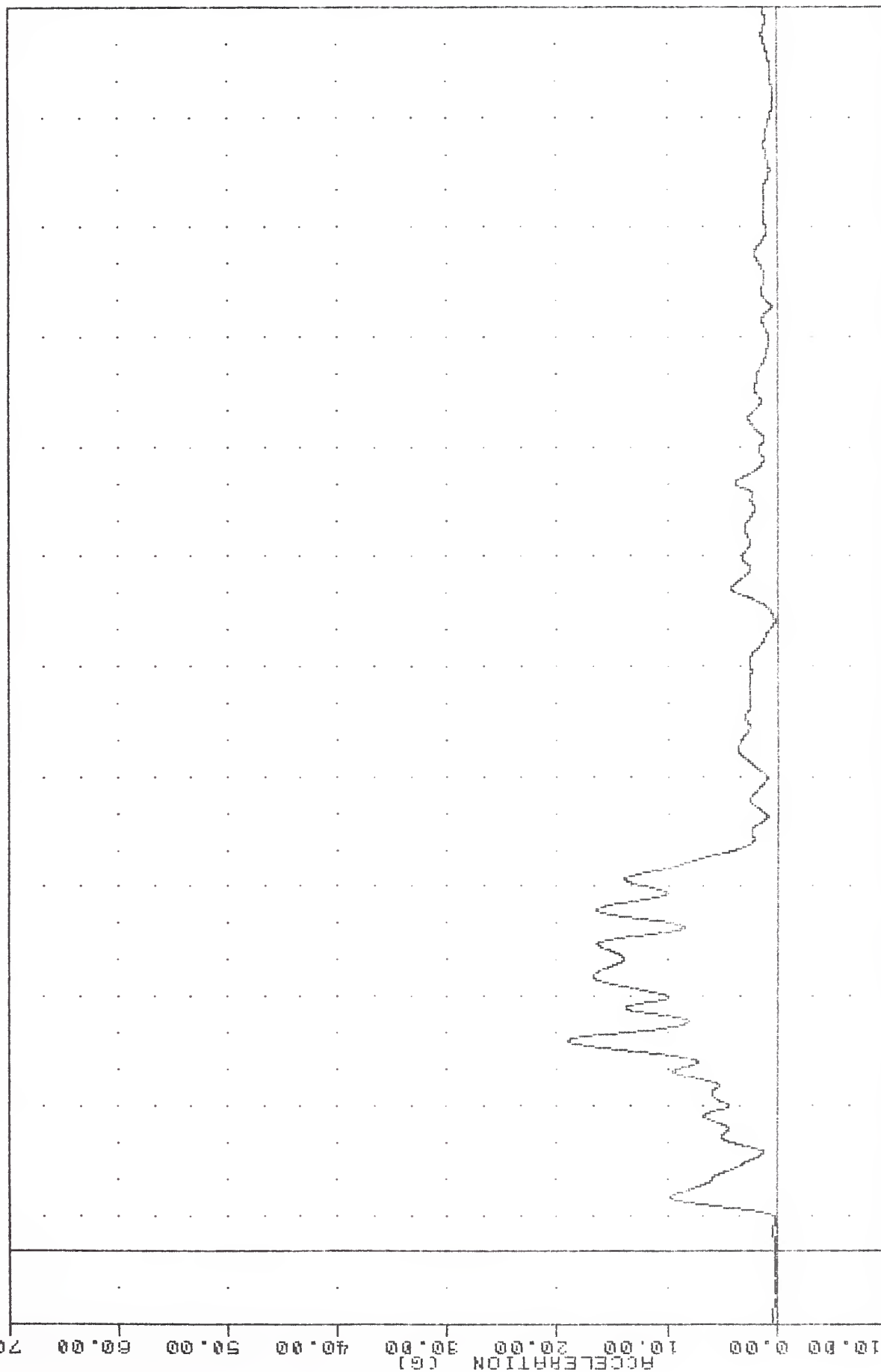
TAC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 RASR62

PLU1 WHIE 30-JUL-84 11:17:16

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = 0.030 -12.38 , 19.04 0 57.63

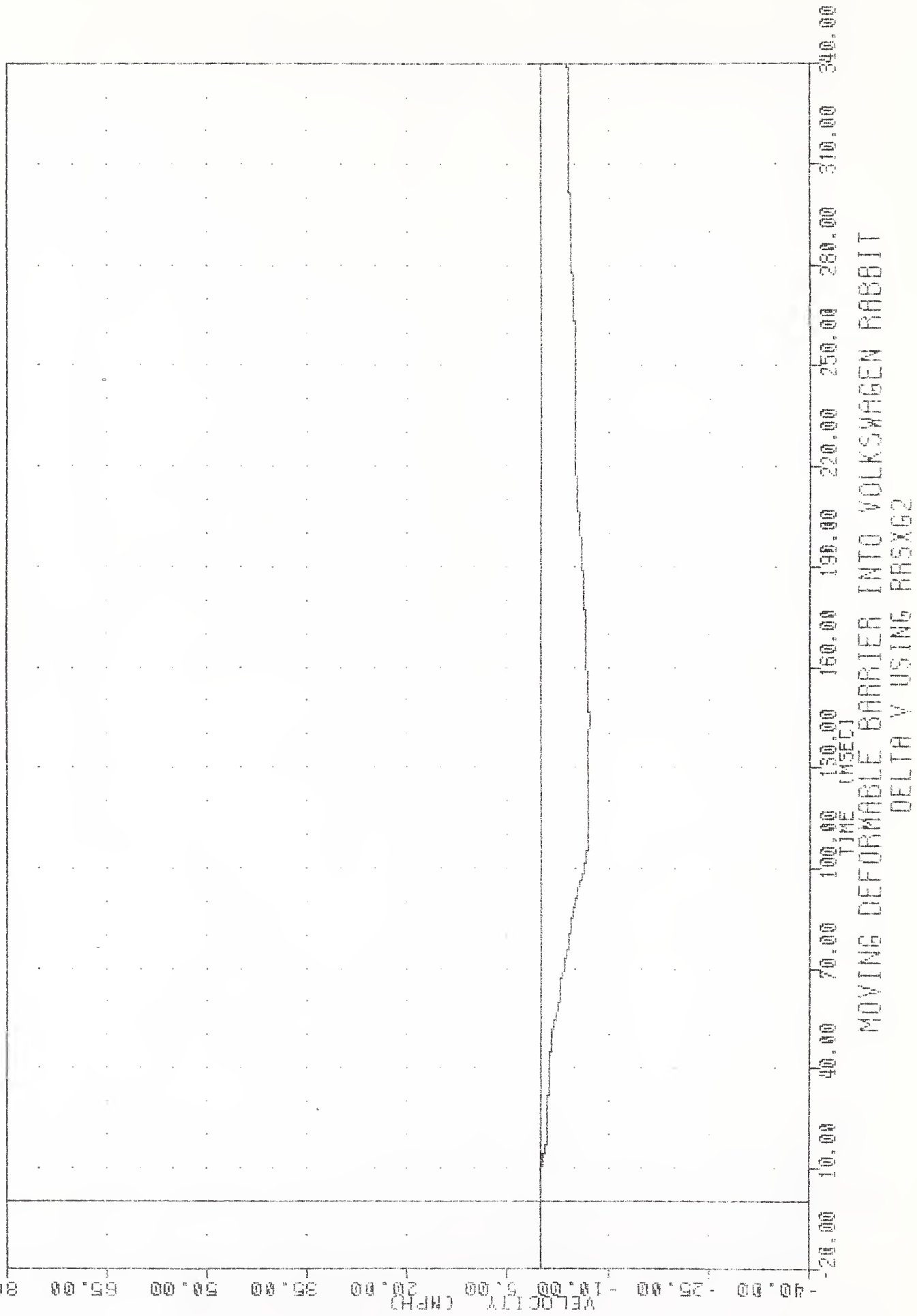
70.00



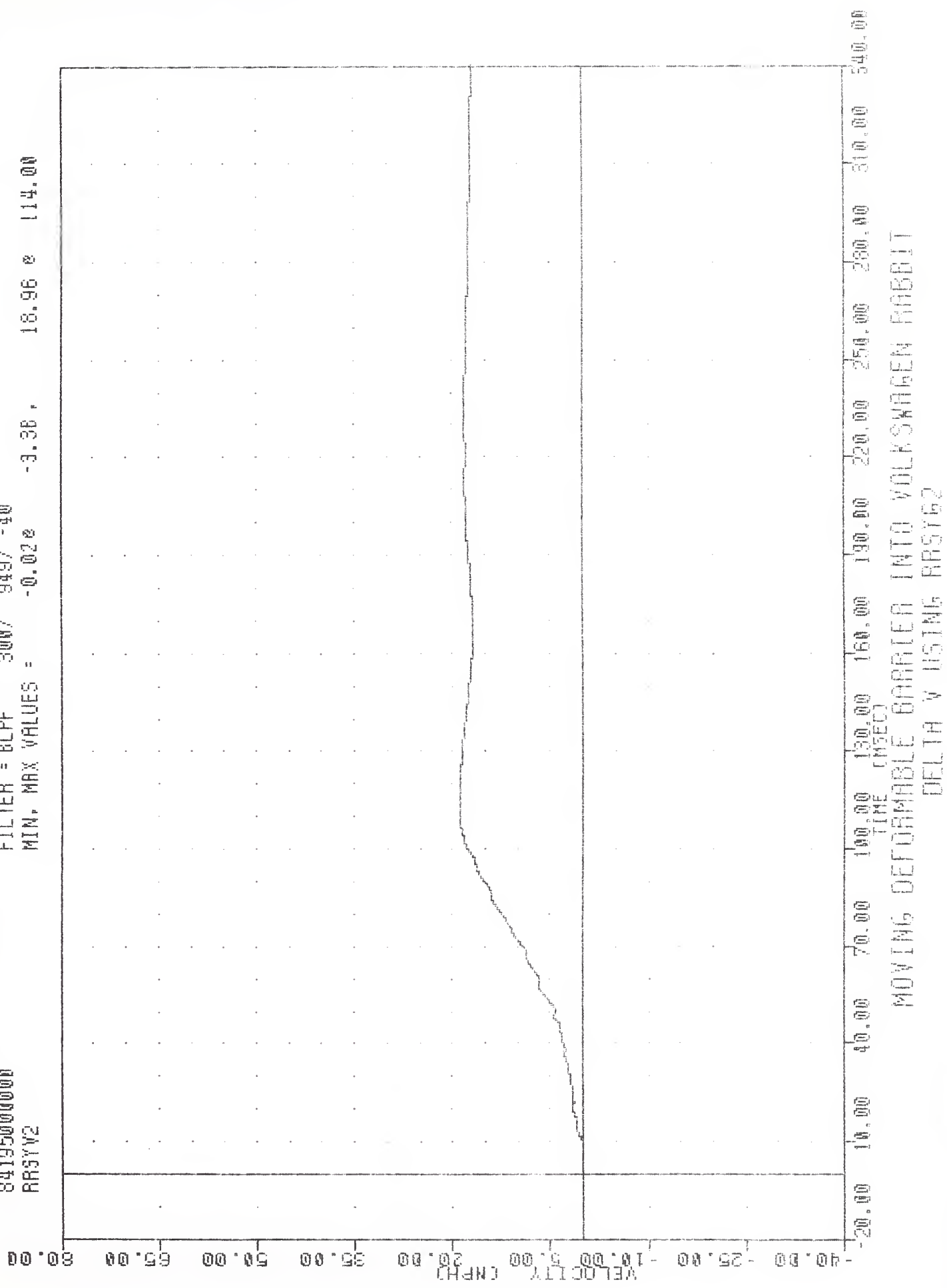
-10.00 0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00
 -20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 VEHICLE RIGHT REAR SILL RESULTANT

TRC , 840713 PLOT DATE 13-AUG-84 14:15:43
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 ARSXV2
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -7.14e 145.25 , 0.02 e -5.25



TRC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 RRSYV2
 PLOT DATE 13-AUG-84 14:15:43
 FILTER = 0LFF 300/ 949/ -40
 MIN, MAX VALUES = -0.020 -3.38 , 18.96 0 114.00

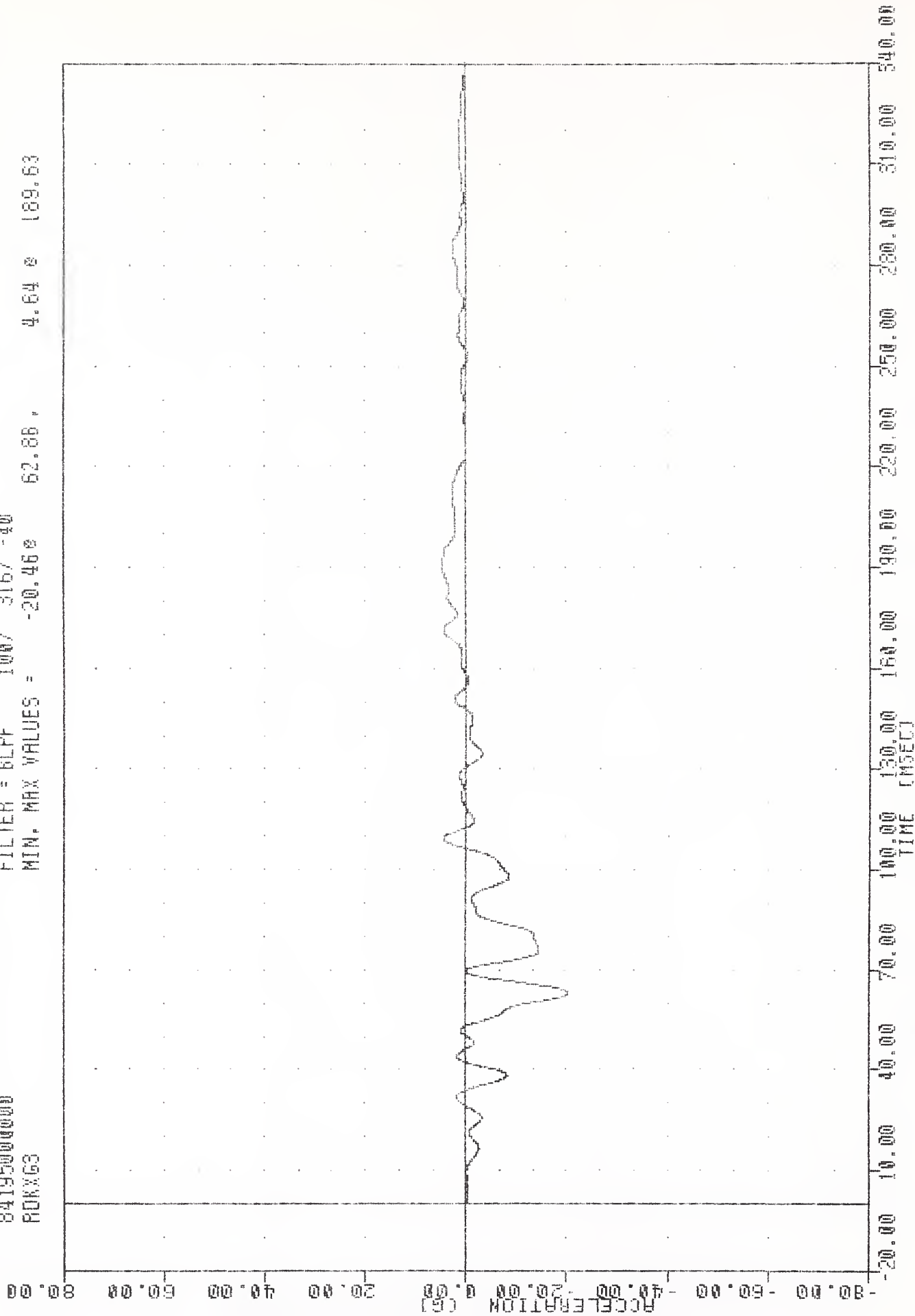


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING RRSY62

TRC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 ROKXG3

PLOT DATE 13-AUG-84 14:18:20

FILTER = 6LPF 100/ 316/ -40
 MIN. MAX VALUES = -20.460 62.86 , 4.64 189.63



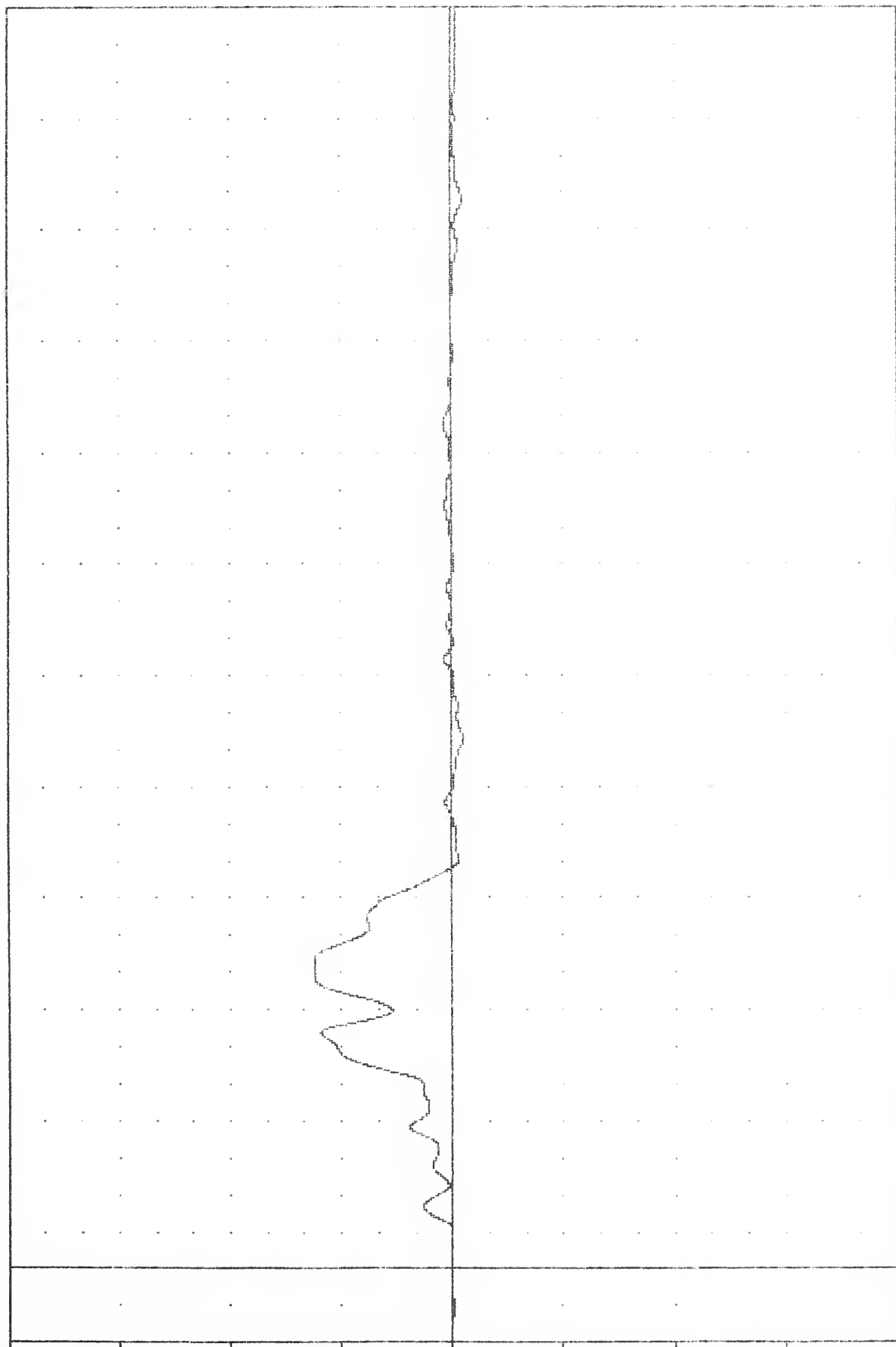
IHC
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 ROKY63

PLU1 UH1E 13-MUG-84 14:18:20

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -2.130 142.63, 24.80 * 79.38

ACCELERATION [G]



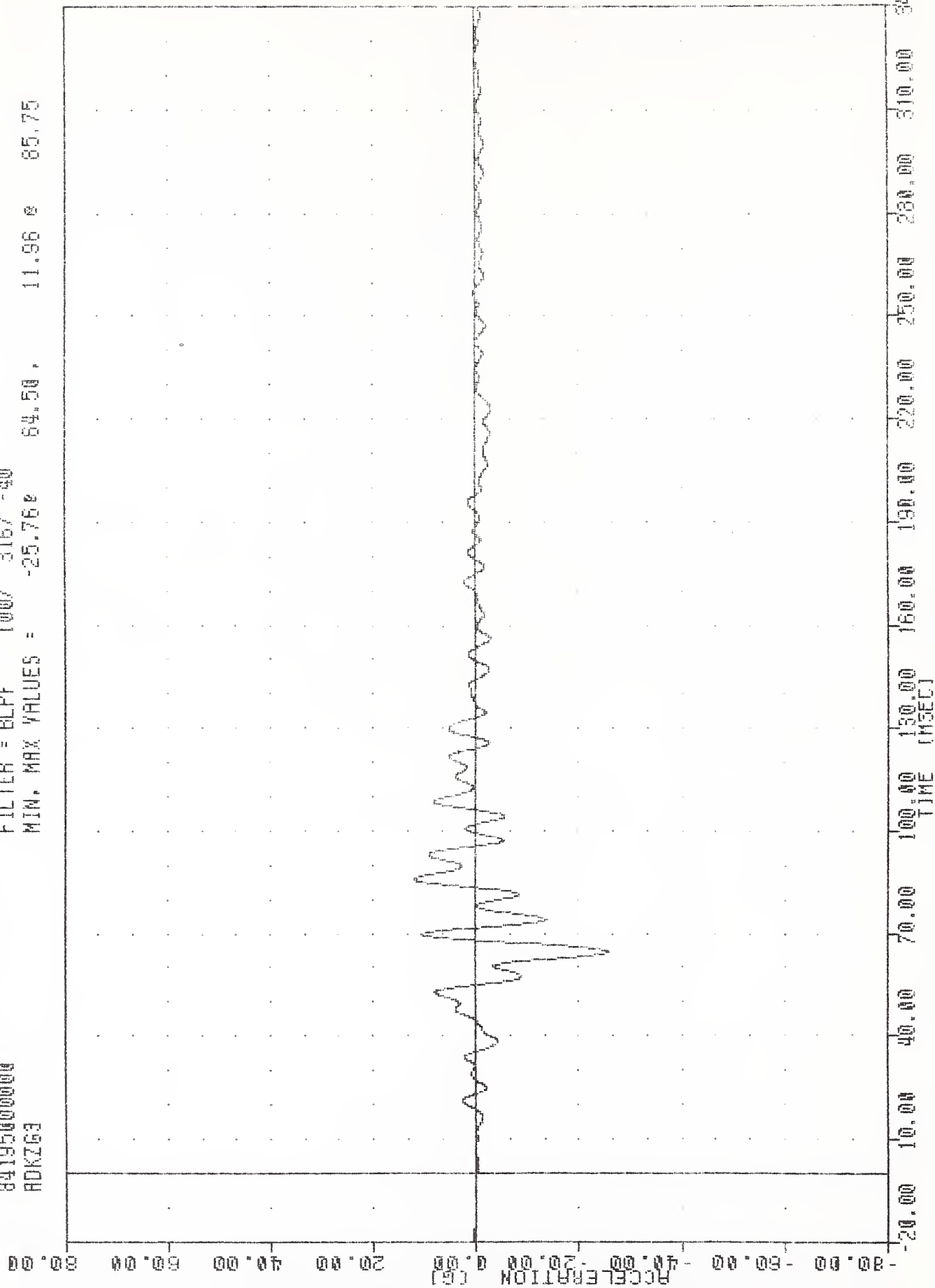
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN PASSAT
VEHICLE REAR DECK ACCELERATION Y AXIS

TRC , 840713
SIDE AGGRESSIVE ATTRIBUTES
84195000000
ADKZG3

PLU1 DATE 13-MAY-84 14:18:20

FILTER = BLPF 100/ 316/ -40

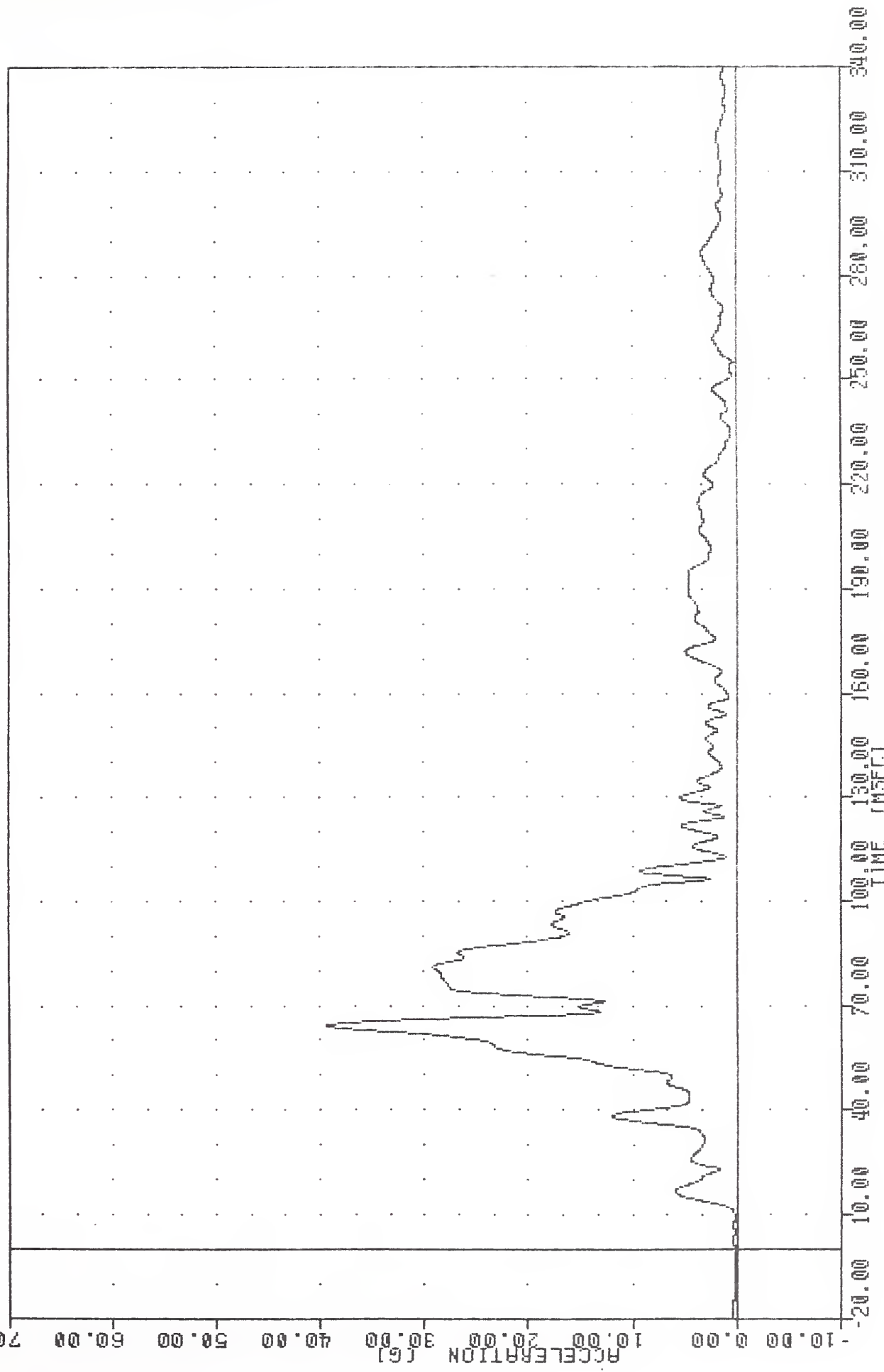
MIN. MAX VALUES = -25.760 64.50 , 11.96 85.75



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE REAR DECK ACCELERATION Z AXIS

TRC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 ADKRG3

PLU DATE 00 JUL 84 11:17:10
 FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = 0.10e -1.25, 39.34 e 64.13



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 VEHICLE REAR DECK RESULTANT

TAC , 840713 PLOT DATE 13-AUG-84 14:15:43

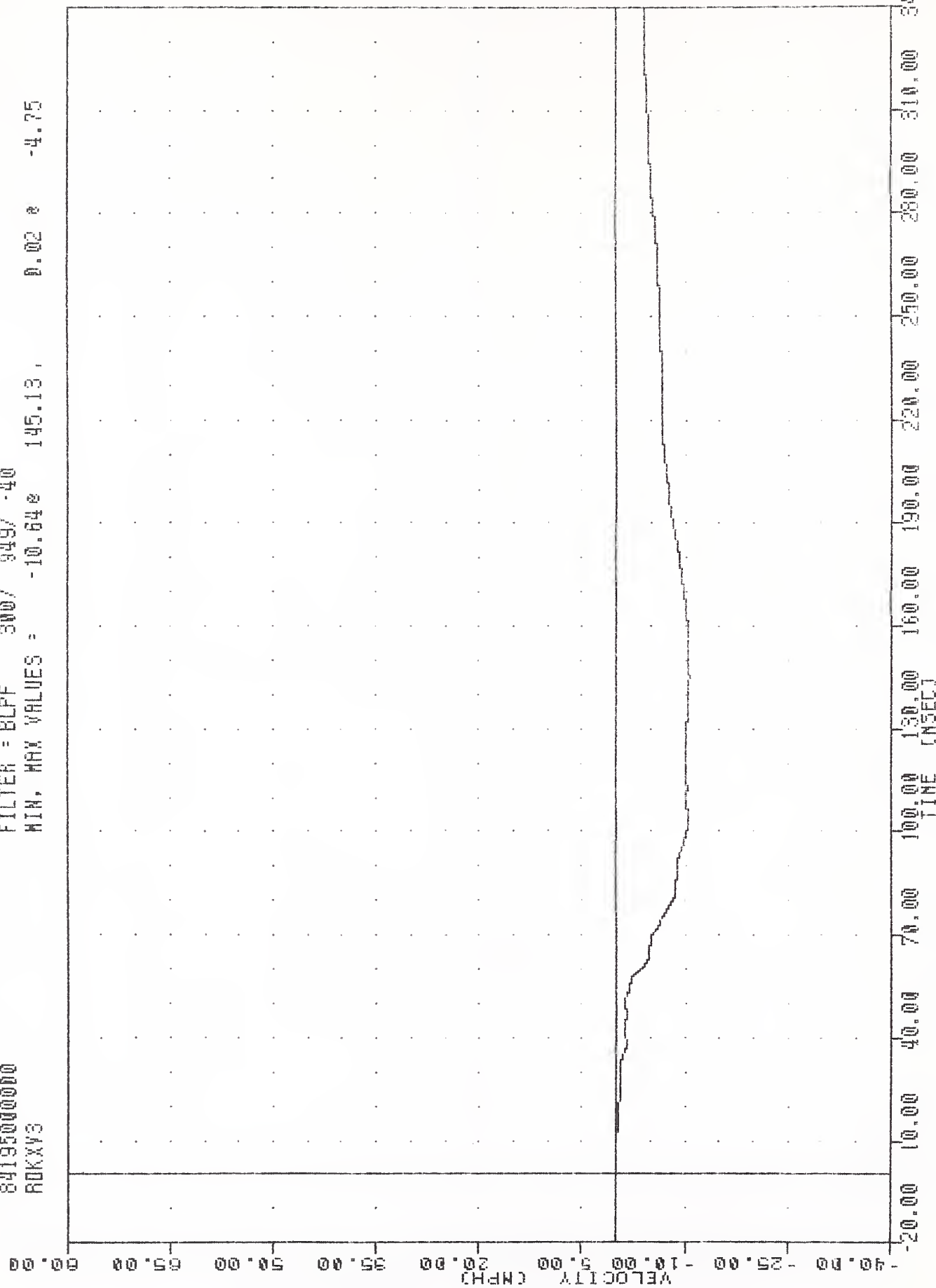
SIDE AGGRESSIVE ATTRIBUTES

84195000000

RDKXV3

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -10.640 145.13, 0.02 -4.75



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

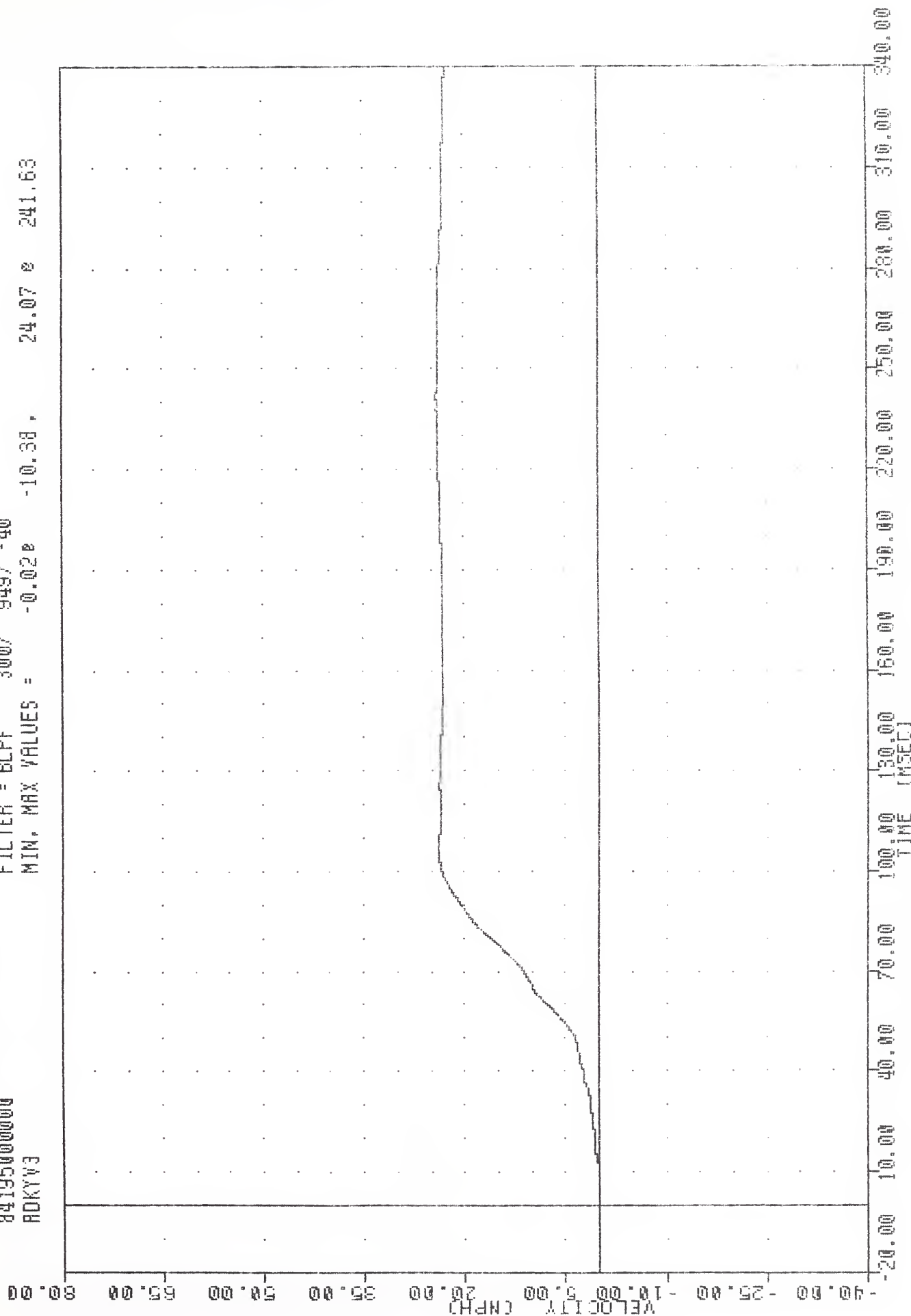
DELTA V USING RDKXG3

TRC ,840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 RDKYV3

PLOT DATE 13-AUG-84 14:15:43

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -0.020 -10.30 , 24.07 241.63



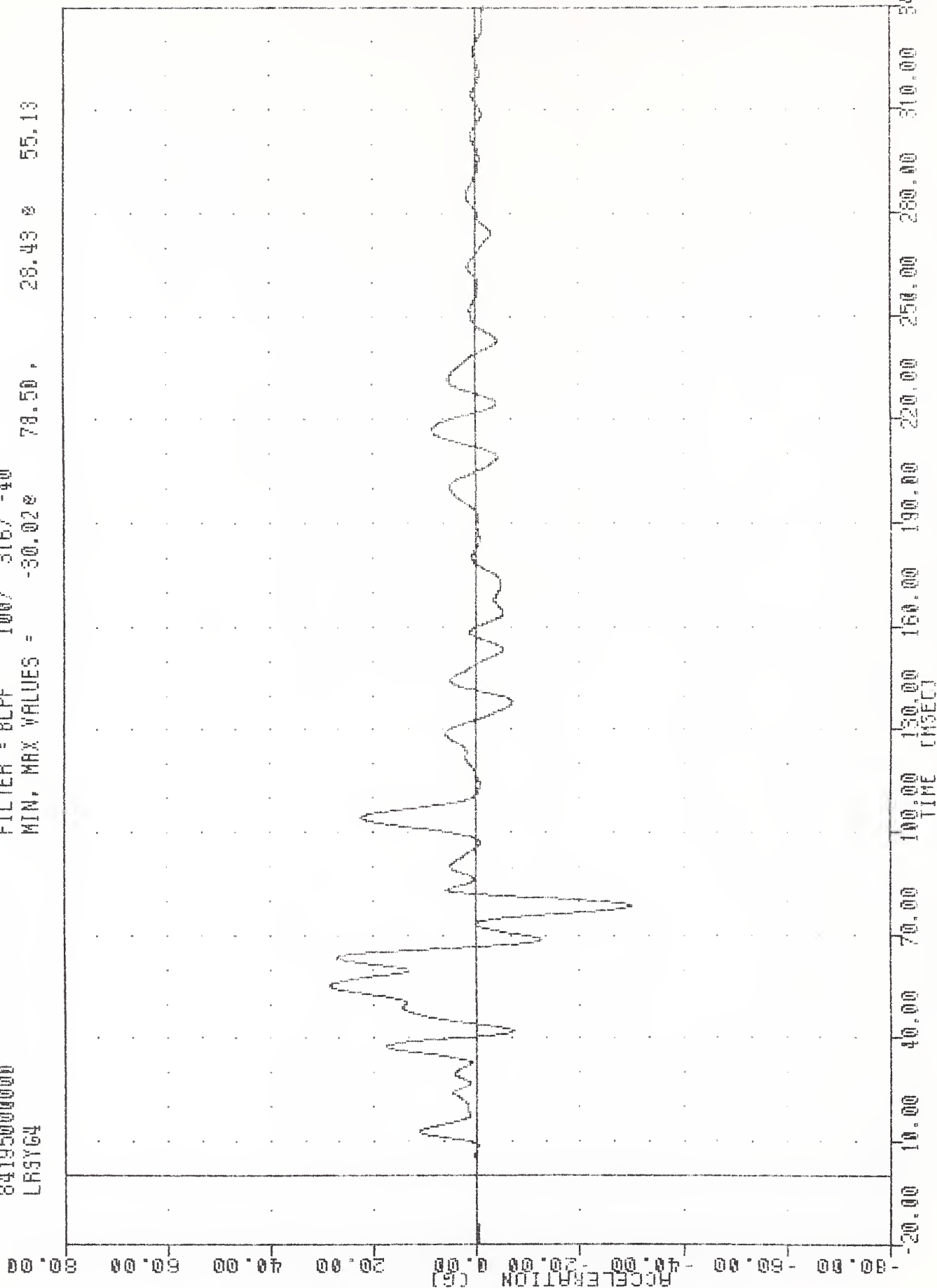
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING RDKY63

TBC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 LRSYG4

PLOT DATE 13-MAY-84 14:10.20

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -30.028 78.50 , 28.43 55.13



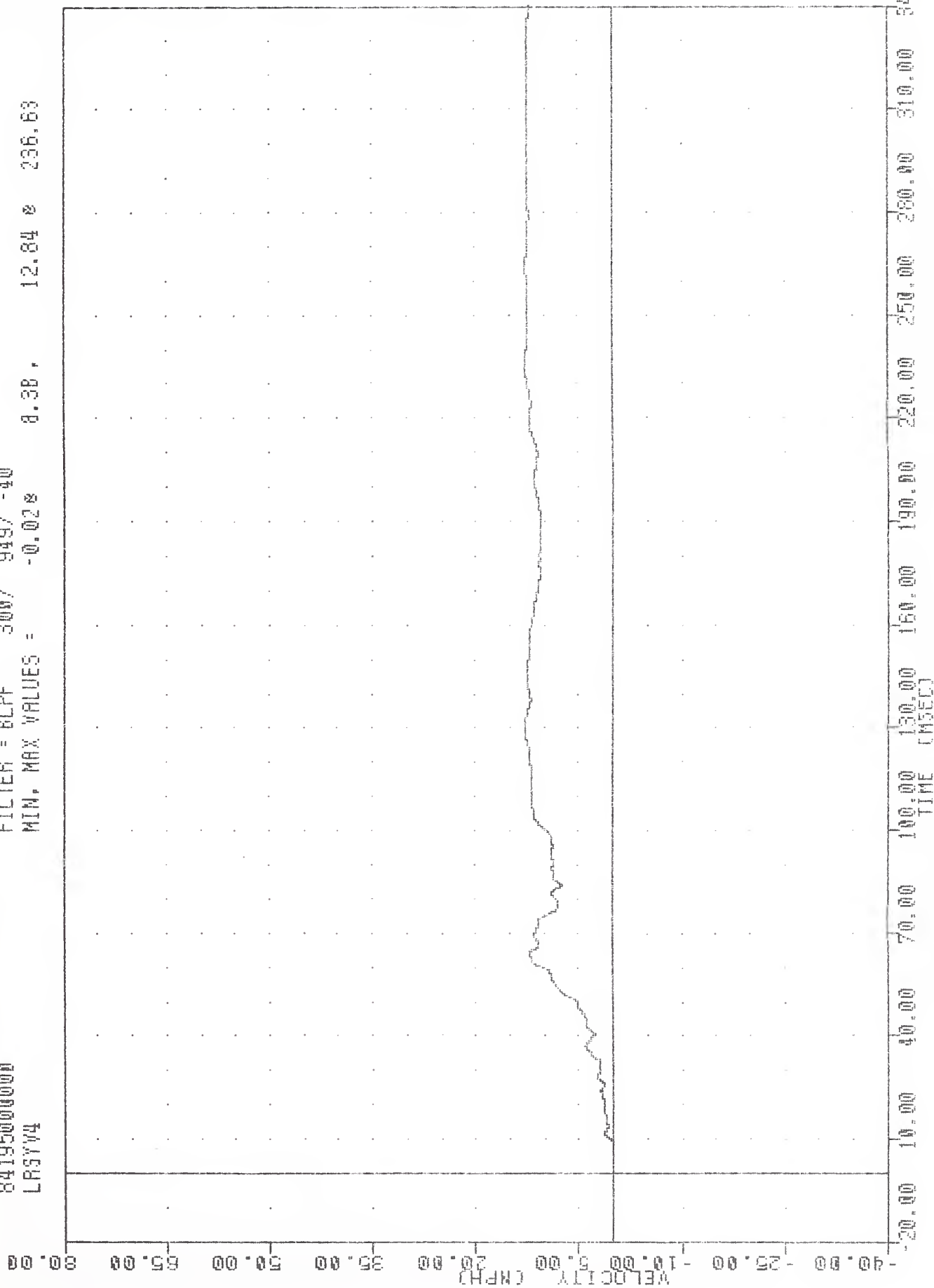
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 VEHICLE LEFT REAR SILL ACCELERATION Y AXIS

TAC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 LRSYV4

FLUI DRIE 13-AUG-84 14:15:45

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -0.028 0.38 , 12.84 238.63



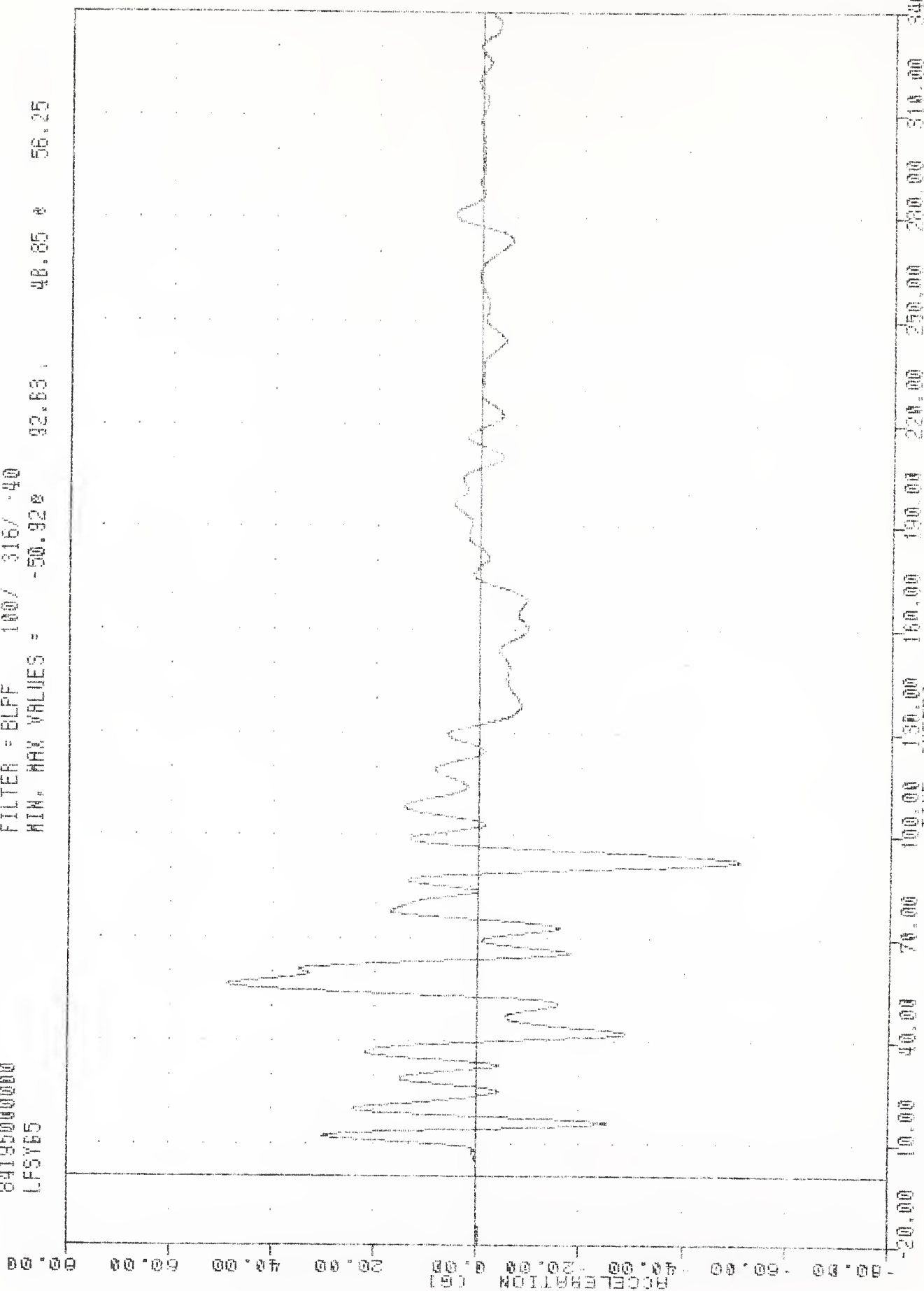
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LRSY64

TAC 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84185000000
 LFSYB5

PLOT DATE 13-HUB-84 14:10:20

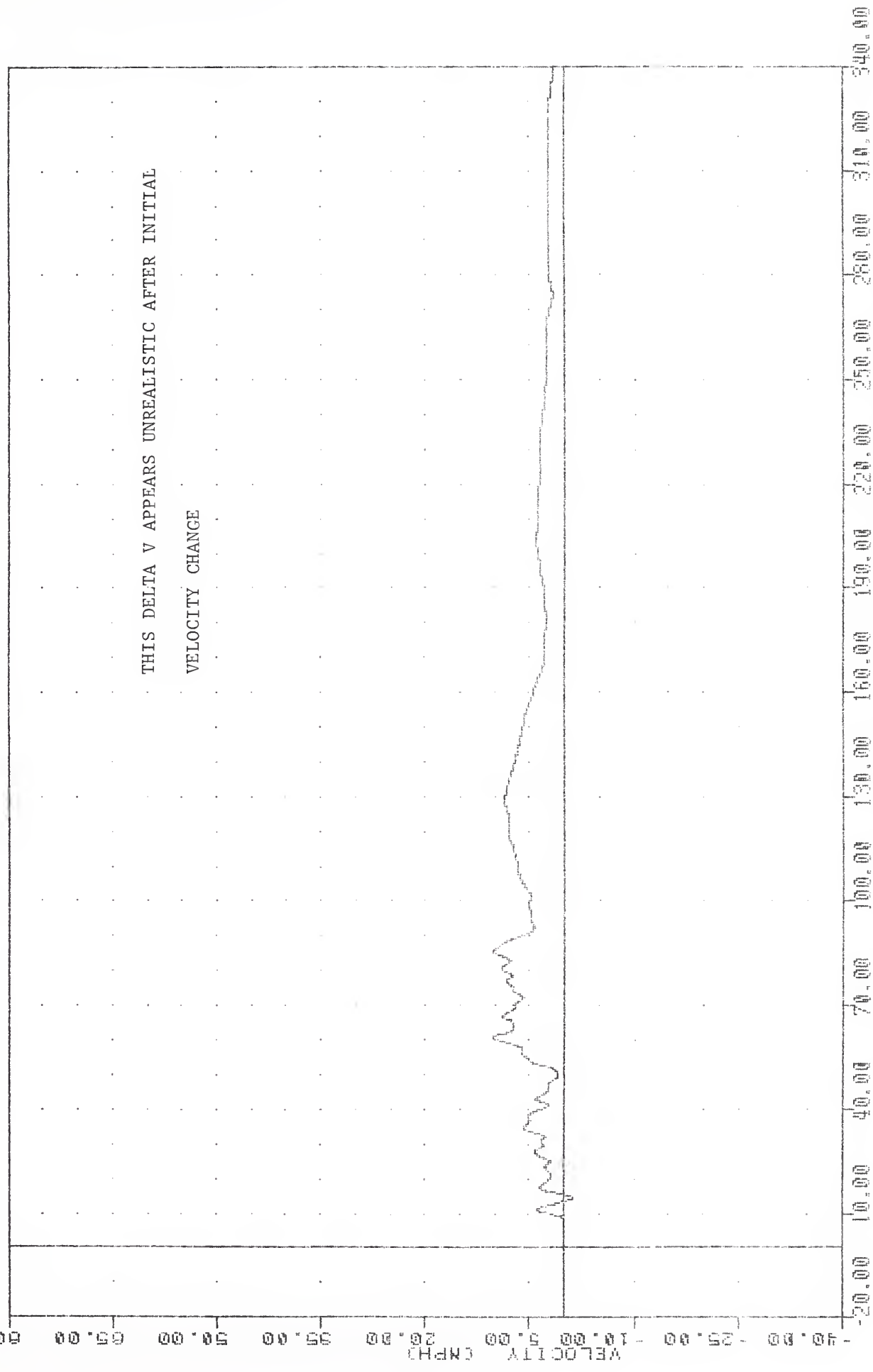
FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -50.92 92.63 48.85 * 56.25



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 VEHICLE LEFT FRONT SILL ACCELERATION Y AXIS

TAC 840713 PLOT DATE 13-HUG-84 14:15:43
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 LFSYV5
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -1.328 14.38 10.33 * 60.50



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LFSYV5

SIDE AGGRESSIVE ATTRIBUTES

84195000000

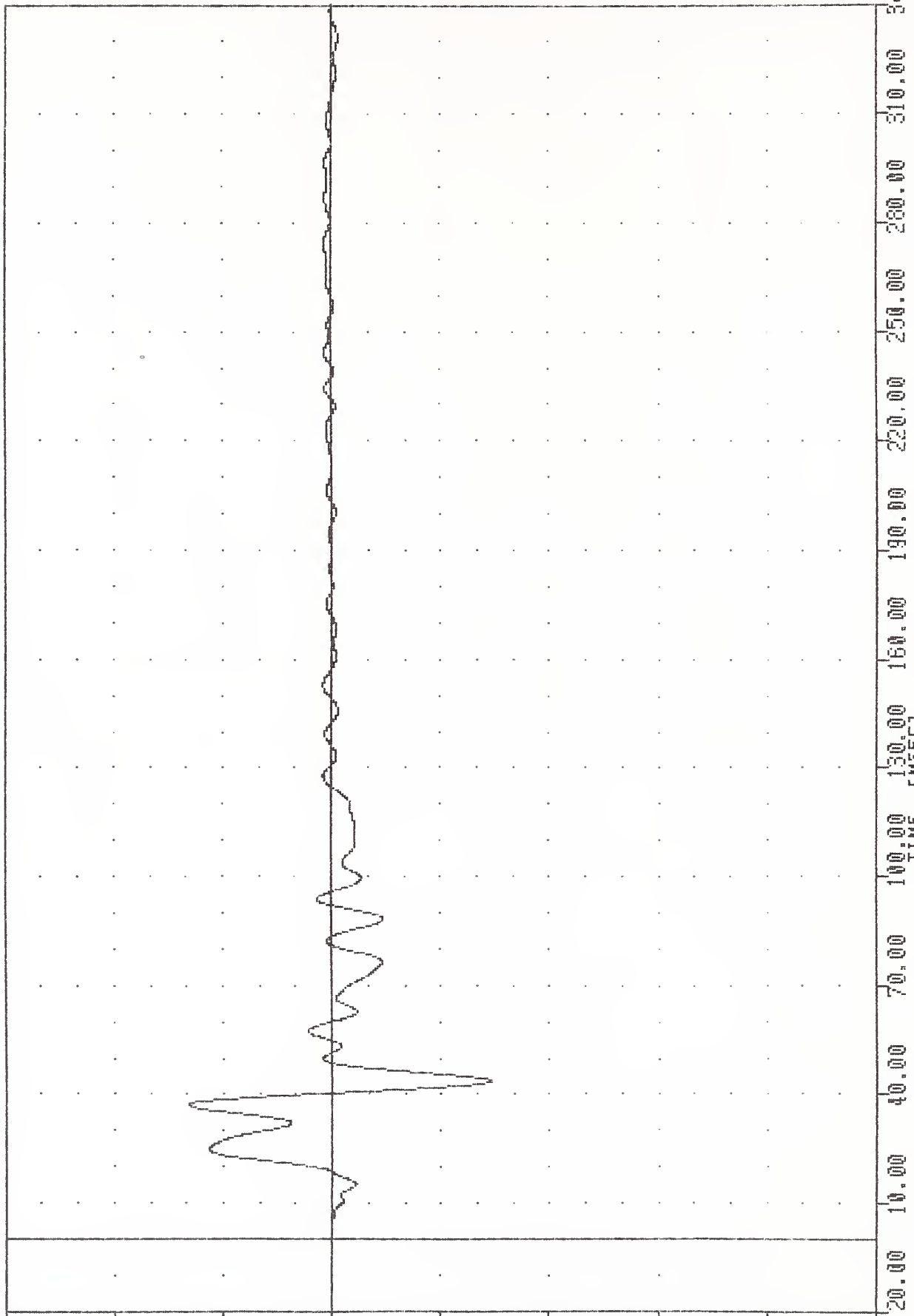
LFDY61

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -116.412 43.63, 105.16 2 37.00

43.63, 105.16 2 37.00

ACCELERATION [G]



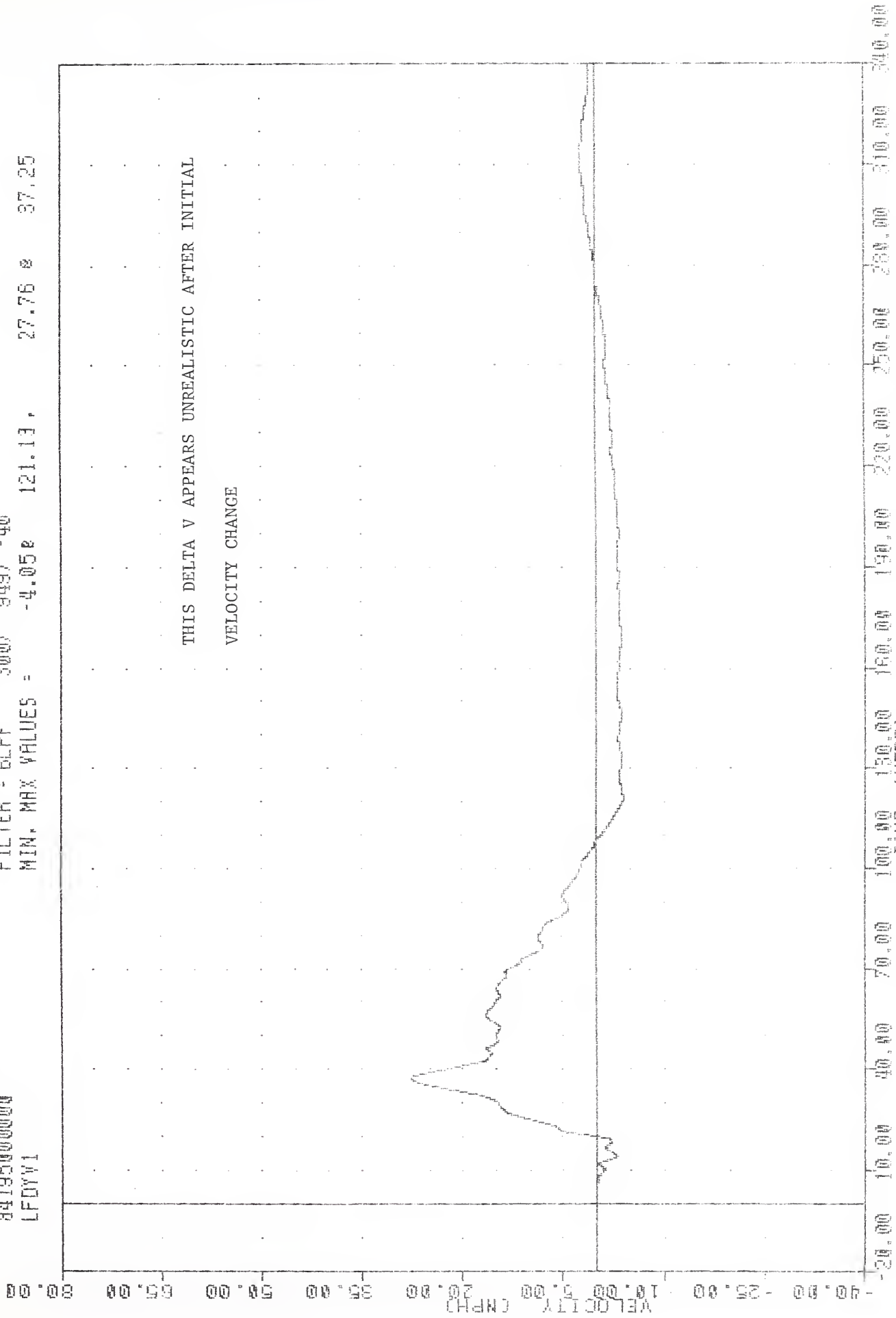
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE LEFT FRONT DOOR (POSITION 6) ACCELERATION Y AXIS

TRC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 LFDYV1

PLU1 UN1E 13-AUG-84 14:15:43

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -4.058 121.13, 27.76 37.25



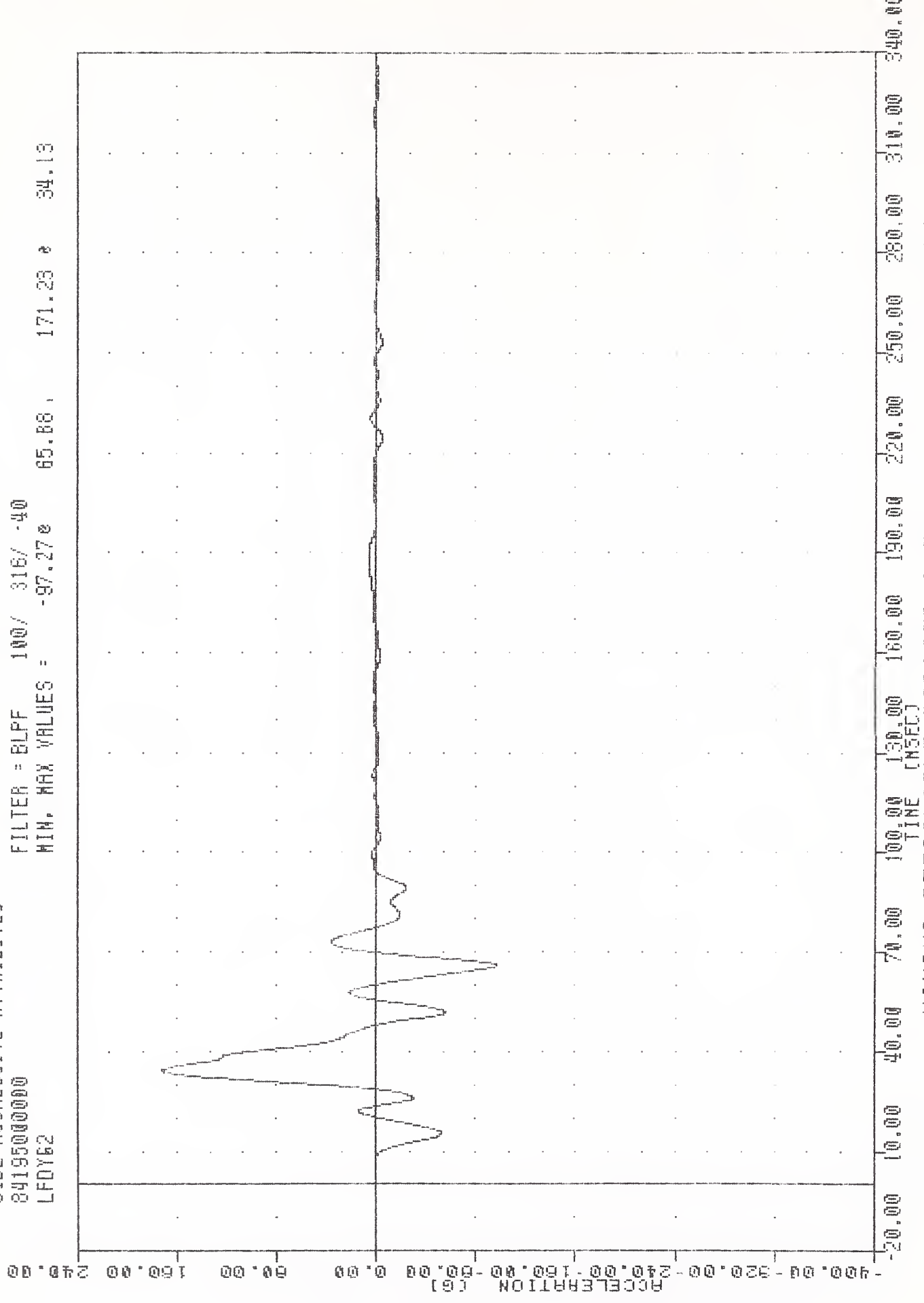
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN PASSBT
 DELTA V USING LFDYV1

TAC , 840713
SIDE AGGRESSIVE ATTRIBUTES
84195000000
LFDY62

PLOT DATE 30-JUL-84 12:04:50

FILTER = BLPF 100/ 316/ -40

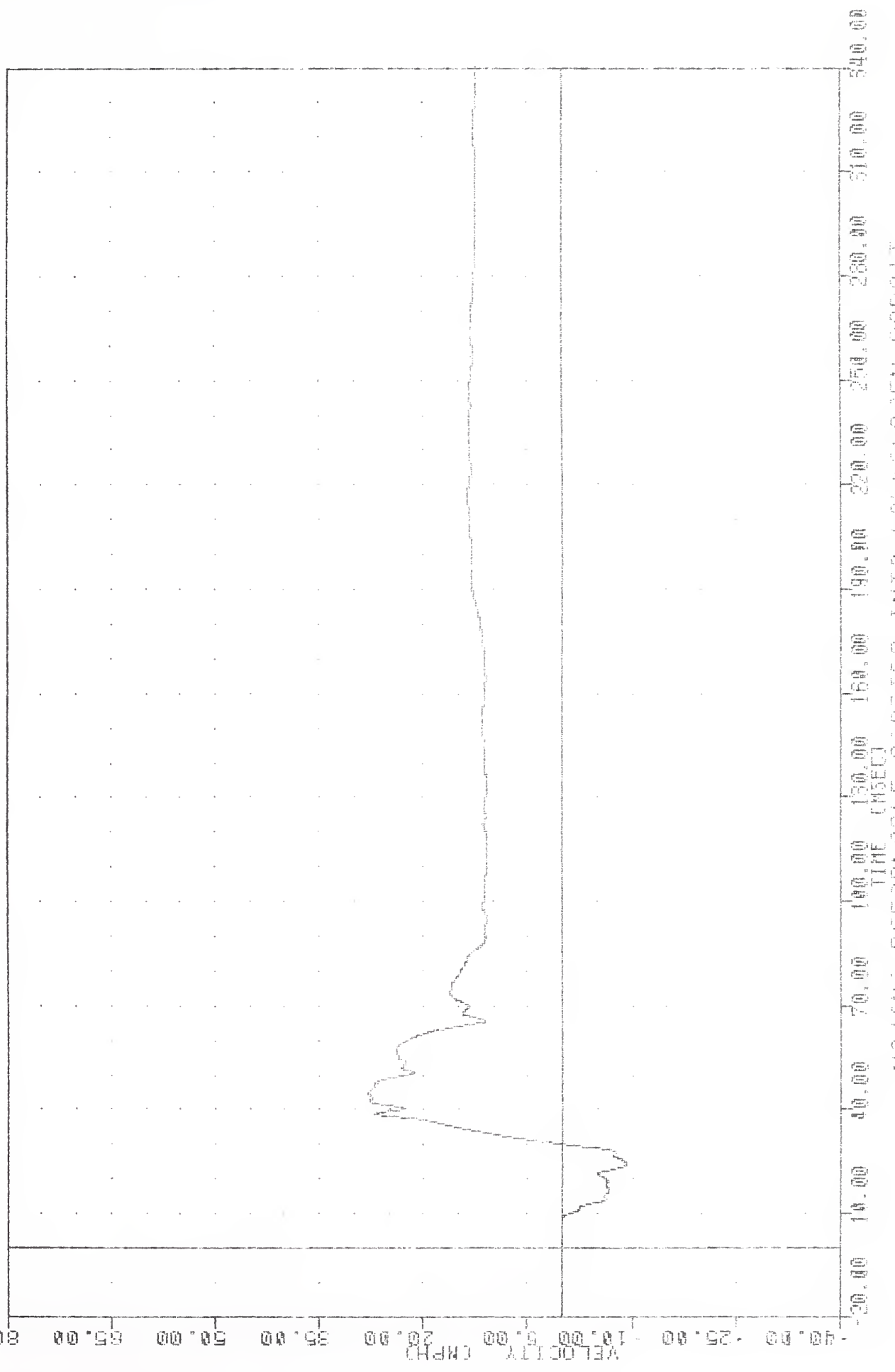
MIN. MAX VALUES = -97.27e 65.88 , 171.23 e 34.13



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE LEFT FRONT DOOR (POSITION 8) ACCELERATION Y AXIS

TRC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 LFOYV2

PLOT DATE 13-AUG-84 14:15:43
 FILTER = 6LFF 300/ 949/ -10
 MIN. MAX VALUES = -9.16 24.13 27.99 8 44.75

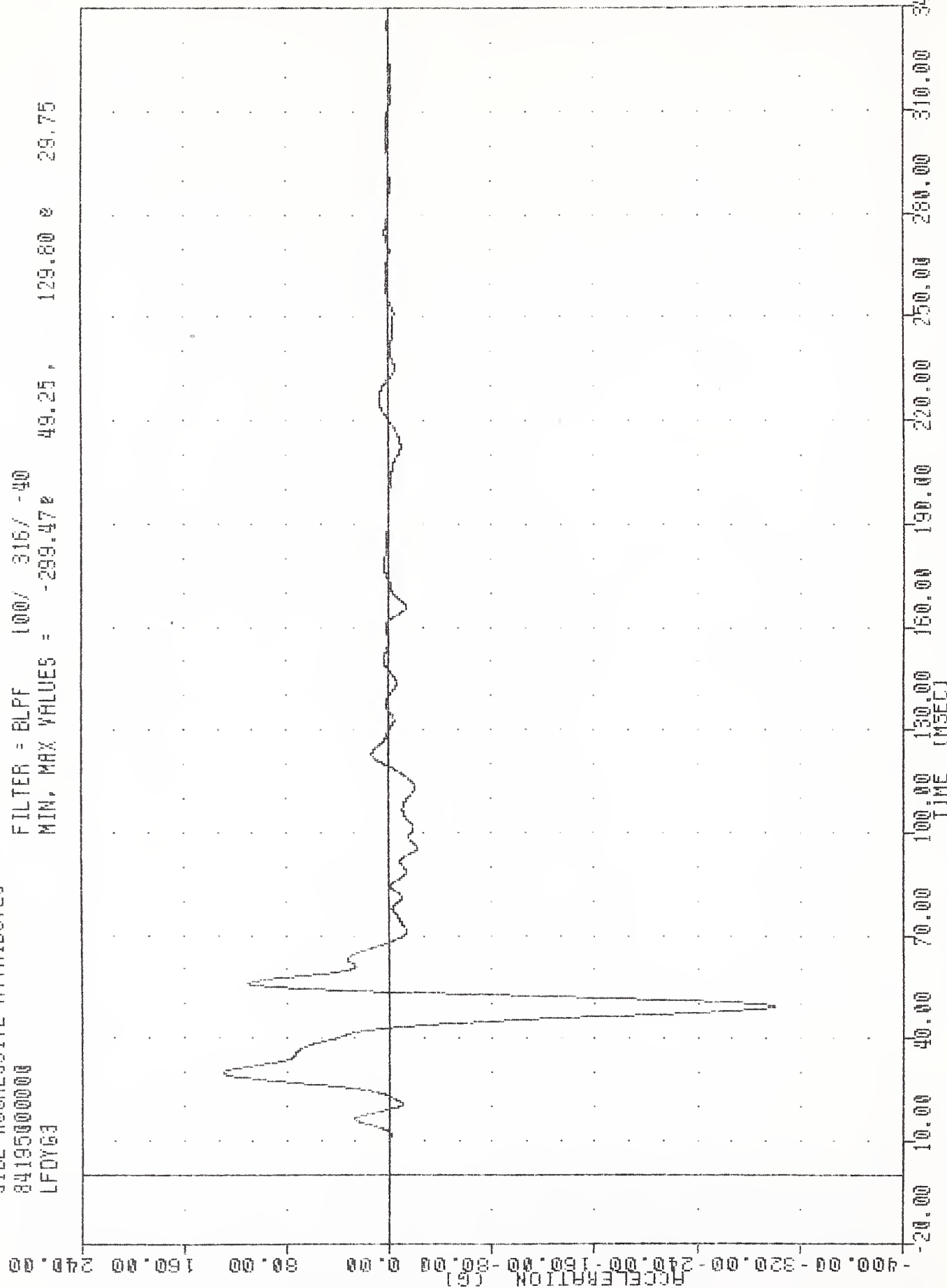


MOVING DEFORMABLE BARRED INTO VOLKSWAGEN RABBIT
 DELIA V USING LFOYV2

PLOT DATE 30-JUL-84 12:04:50

TRC , 840713
SIDE AGGRESSIVE ATTRIBUTES
84195000000
LF0Y63

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -299.47 49.25, 129.80 29.75



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE LEFT FRONT DOOR (POSITION 9) ACCELERATION Y AXIS

TAC 840713
 SIDE AGGRESSIVE ATTRIBUTES
 841950000000
 LFDYV3

PL01 UNIE 13-HUG-84 14:15:45

FILTER = BLFF 300/ 949/ -40

MIN. MAX VALUES = -8.000 251.00 31.87 * 41.13

80.00

75.00

70.00

65.00

60.00

55.00

50.00

45.00

40.00

35.00

30.00

25.00

20.00

15.00

10.00

5.00

0.00

-5.00

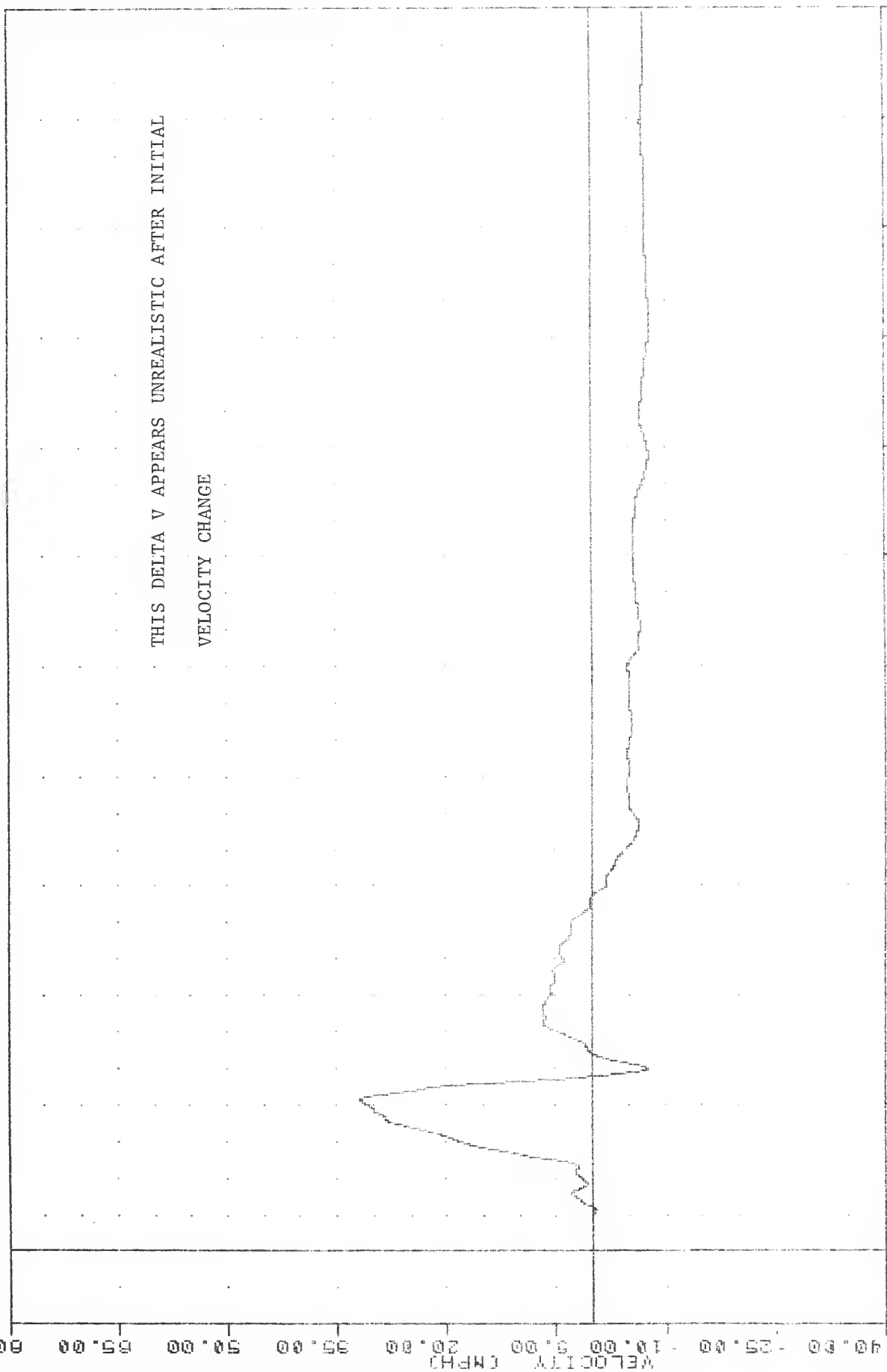
-10.00

-15.00

-20.00

THIS DELTA V APPEARS UNREALISTIC AFTER INITIAL

VELOCITY CHANGE



-20.00 0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00

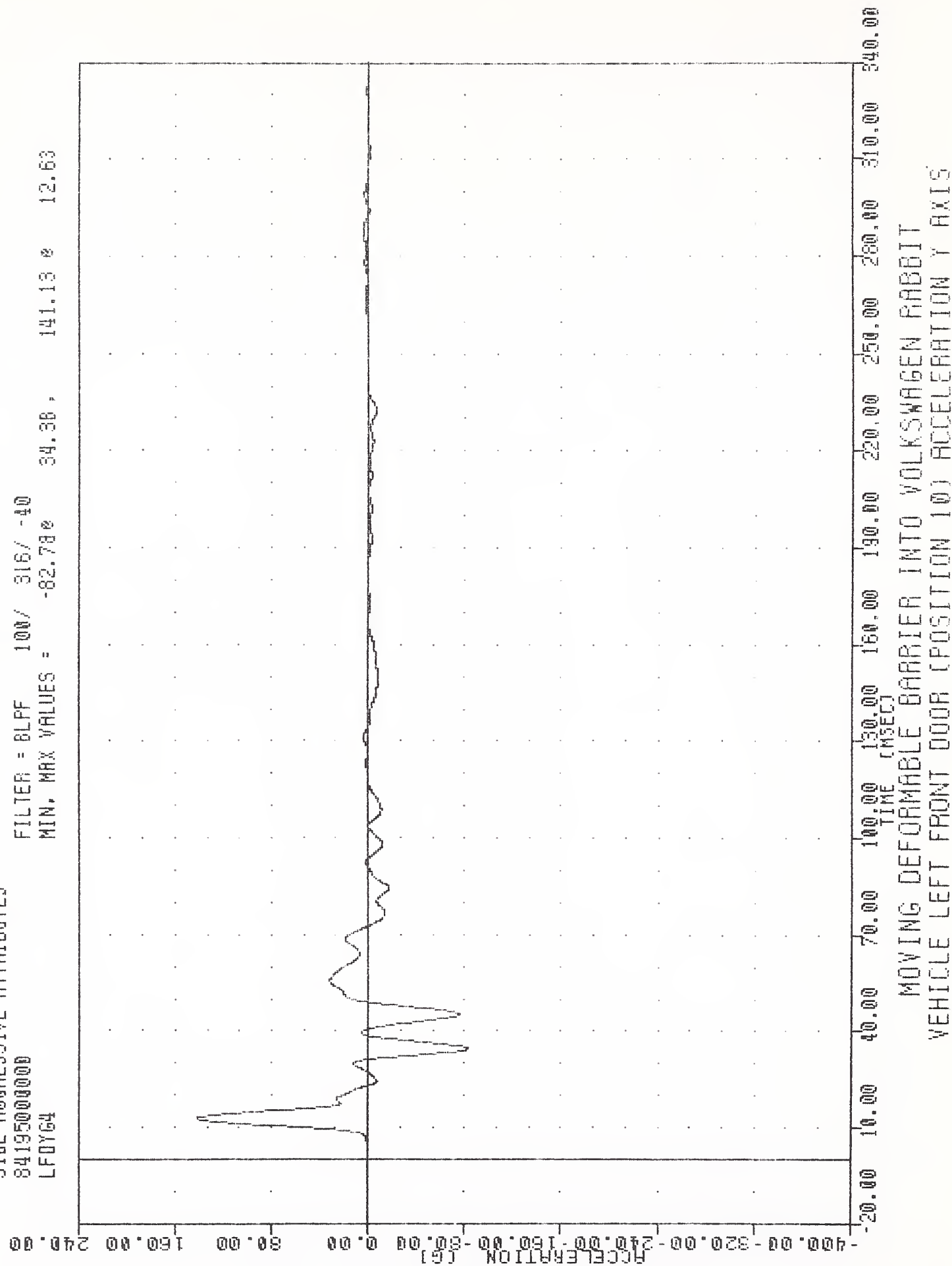
MOVING DEFORMABLE OBJECT INTO VOL SWARMEN SHOOT
 DELTA V USING LFDYV3

TRC , 840713
SIDE AGGRESSIVE ATTRIBUTES
84195000000
LF0Y64

PLOT DATE 30-JUL-84 12:04:50

FILTER = 6LPF 100/ 316/ -40

MIN, MAX VALUES = -82.78e 34.38, 141.13 e 12.63

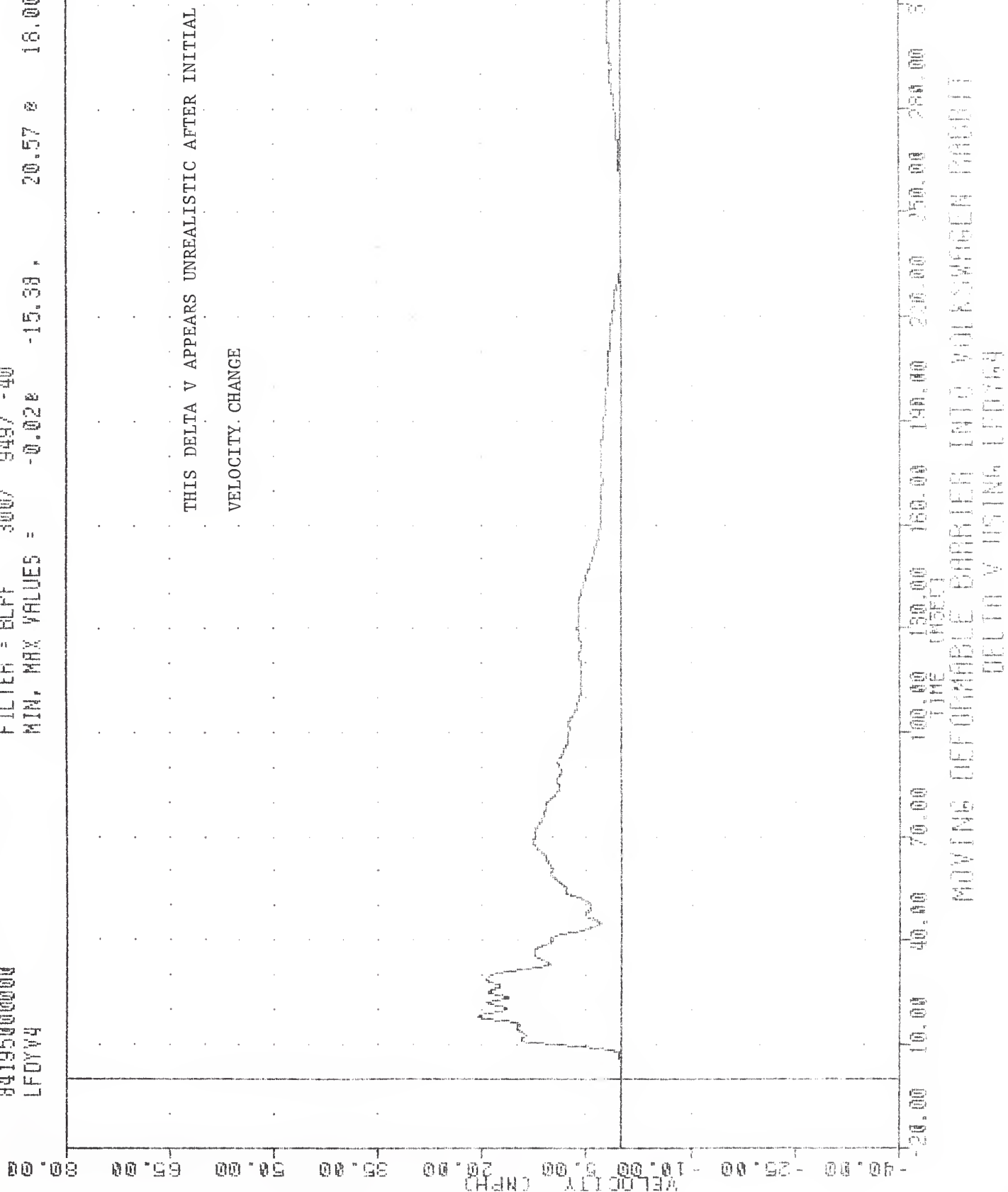


INL 840713
 SIDE AGGRESSIVE ATTRIBUTES
 841950000000
 LFOYV4

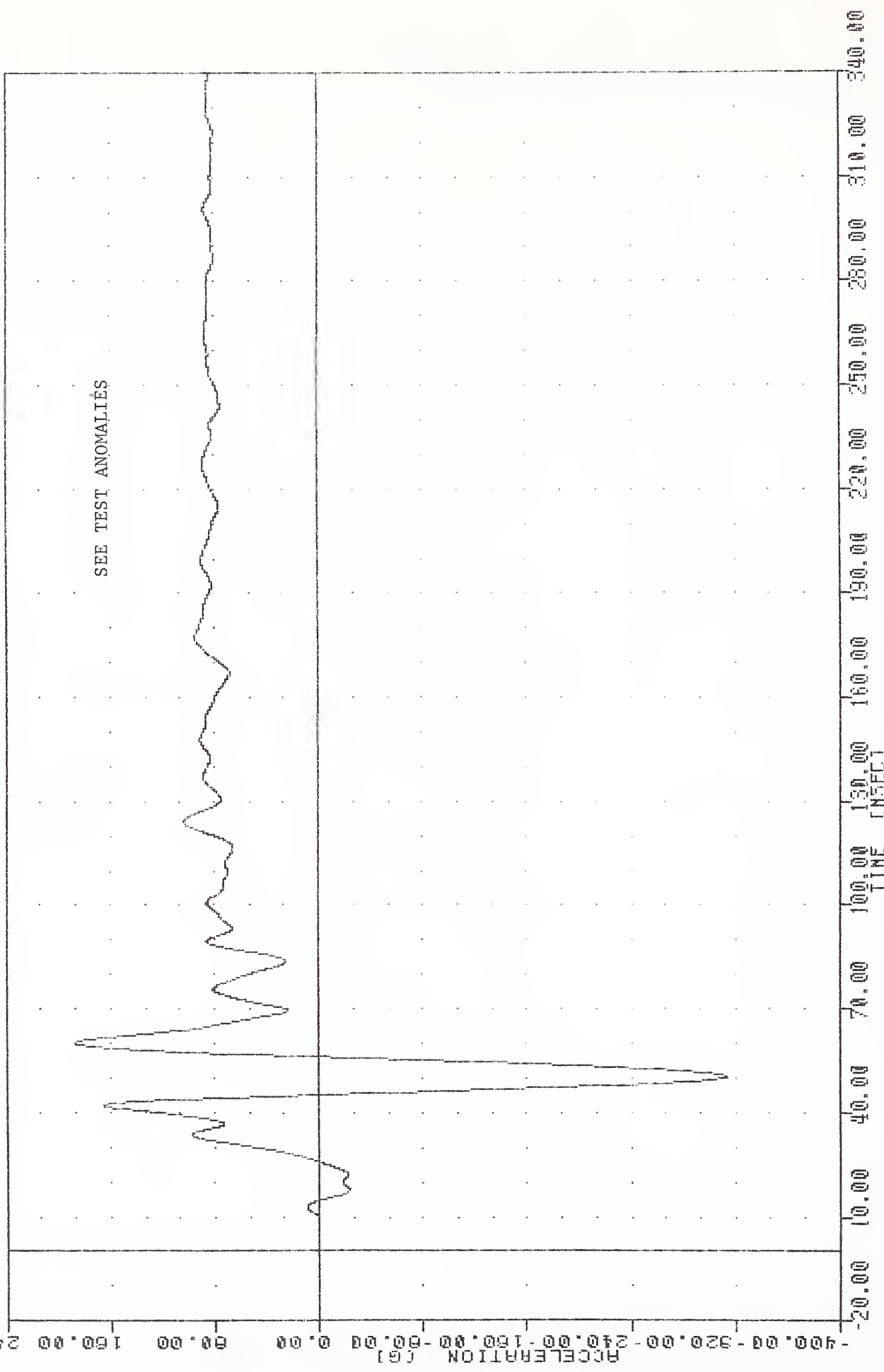
PLU1 DATE 13-AUG-84 14:15:43

FILTER = BLFF 300/ 949/ -40

MIN. MAX VALUES = -0.020 -15.38 20.57 18.00

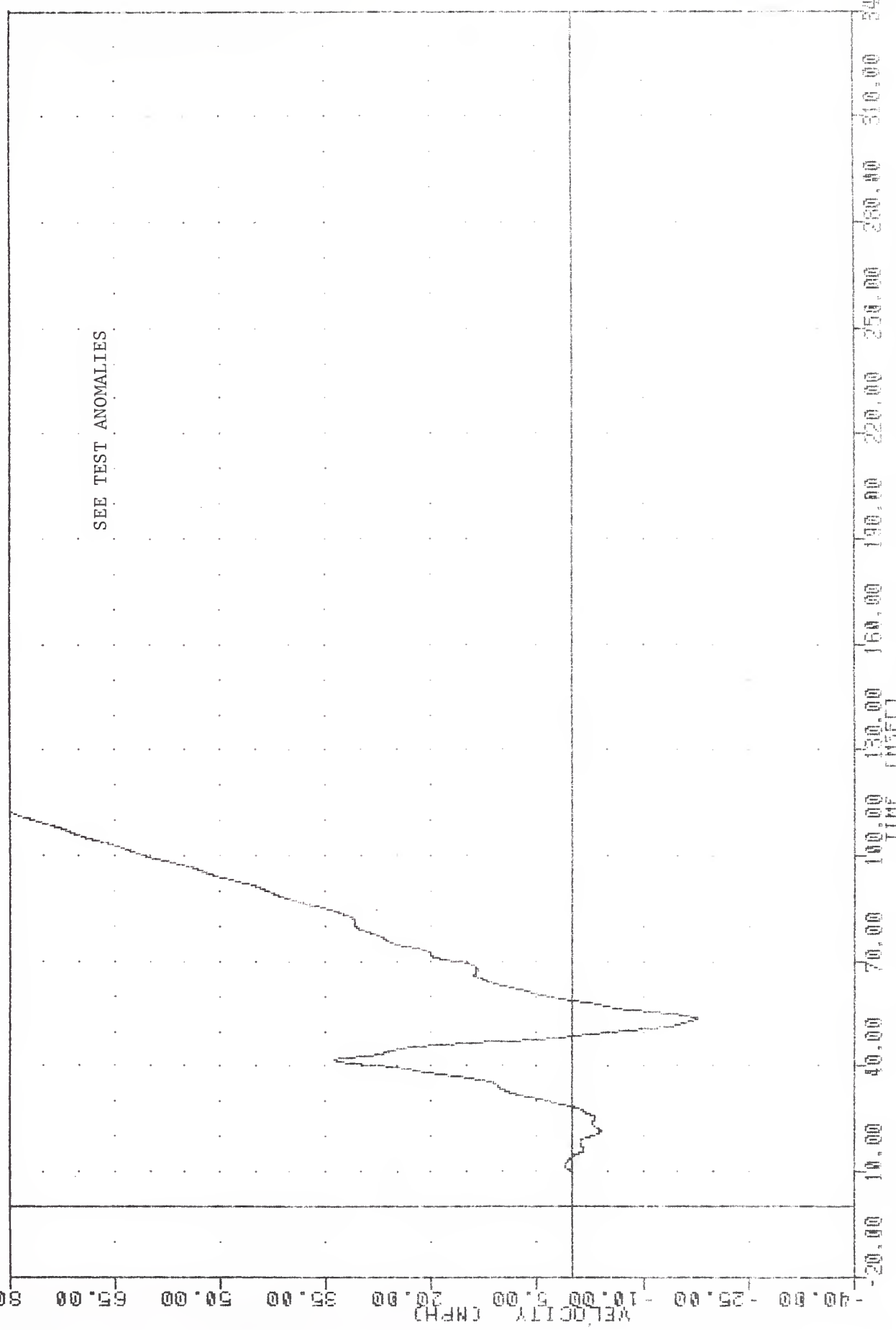


TAC 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 LFOY65
 FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -313.25 50.25 187.39 59.88
 PLOT DATE 30-JUL-84 12:04:50



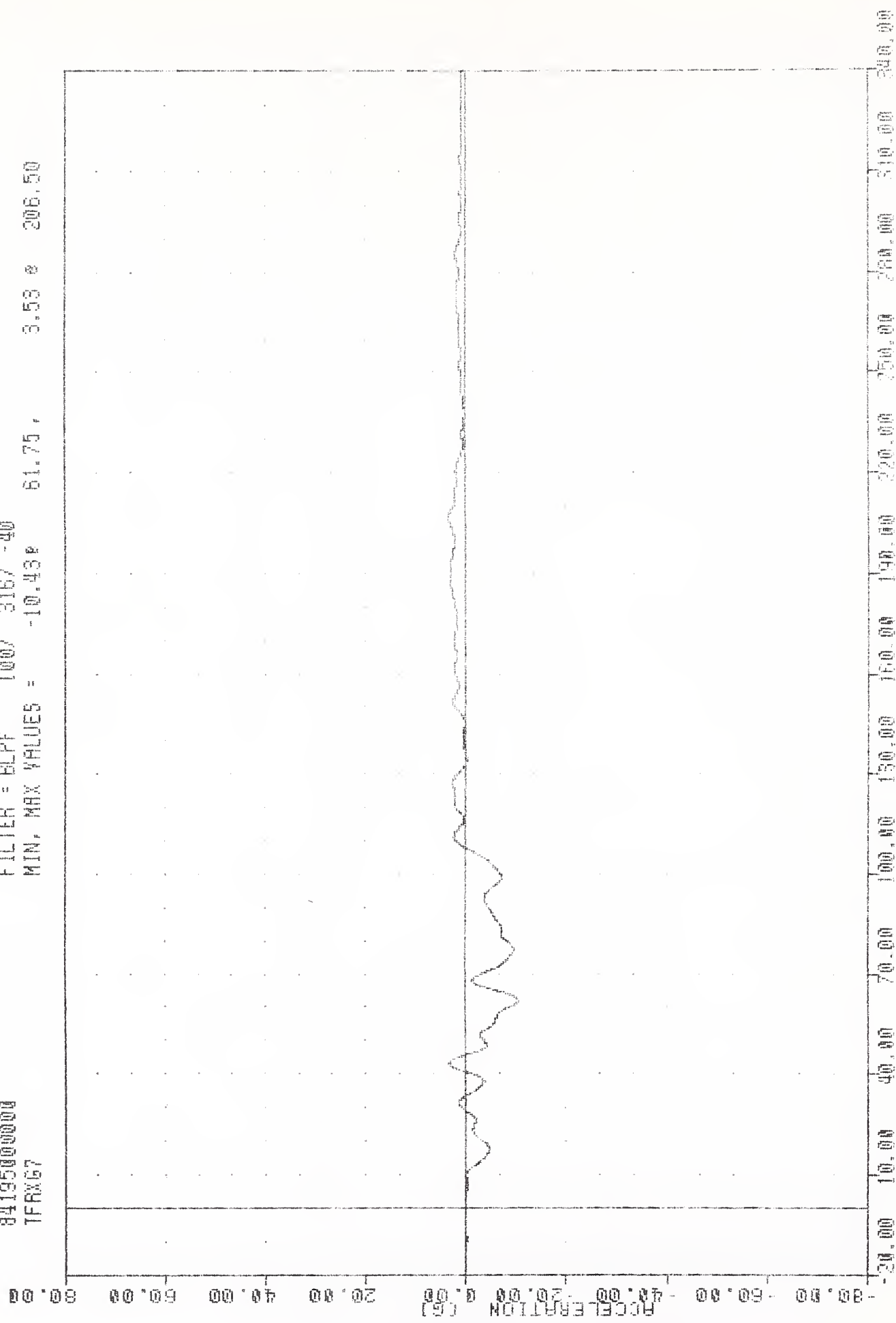
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 VEHICLE LEFT FRONT DOOR (POSITION 11) ACCELERATION Y AXIS

IRL , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 LFOYV5
 PLUI DRIC 13-HUB-04 14:15:43
 FILTER = BLFF 300/ 949/ -40
 MIN. MAX VALUES = -17.682 53.50 , 497.58 2 340.00



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN PASSAT
 DELIA V USING LFOYV5

TRC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 TFRXG7
 PLUT DATE 13-AUG-84 14:18:20
 FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -10.43 61.75, 3.53 206.50



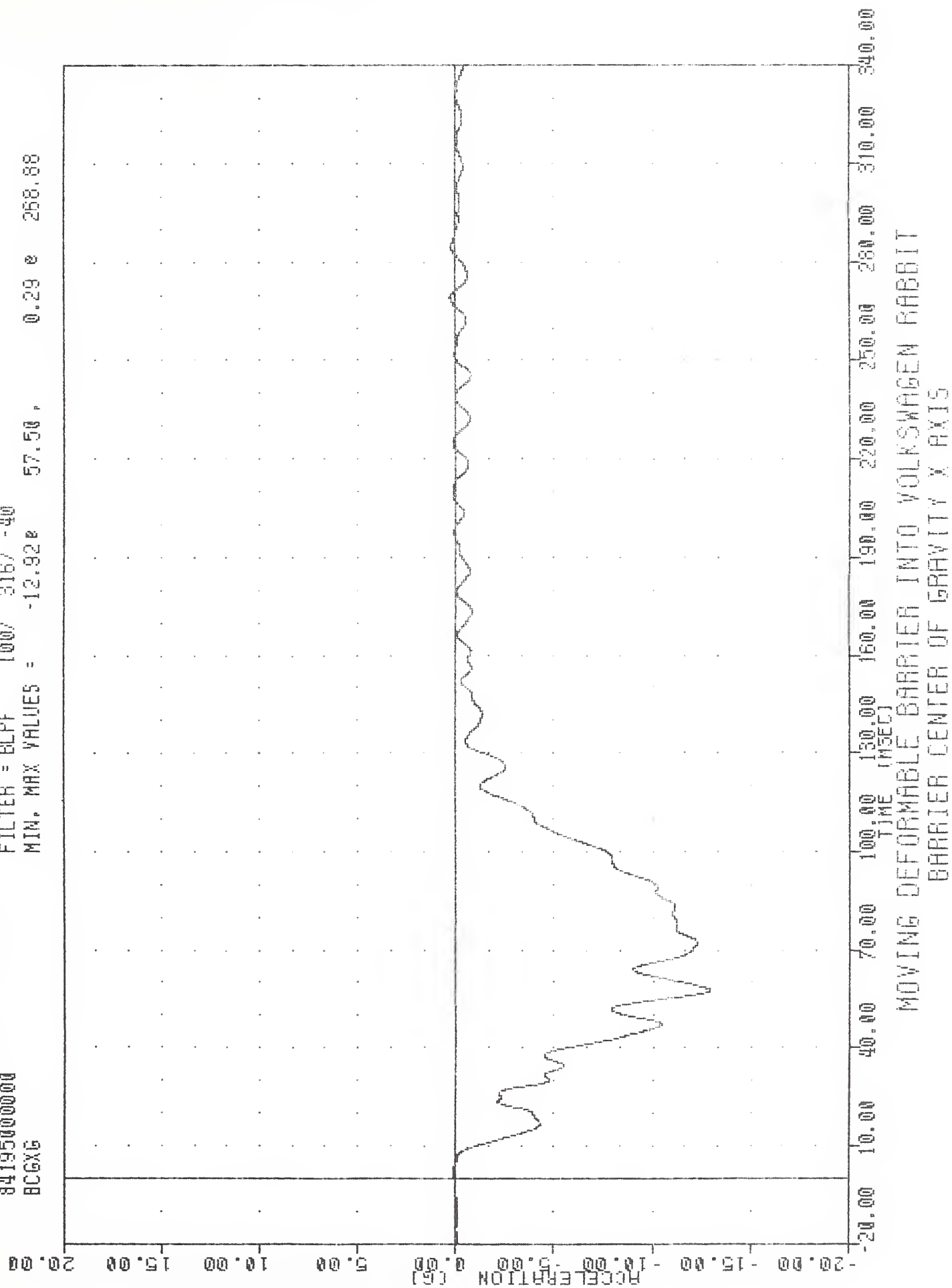
MOVING DEFORMABLE CARTER INTO VOLKSWAGEN PASSEAT
 VEHICLE TRUNK FLOOR RIGHT ACCELERATION X AXIS

INC 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 BCGXG

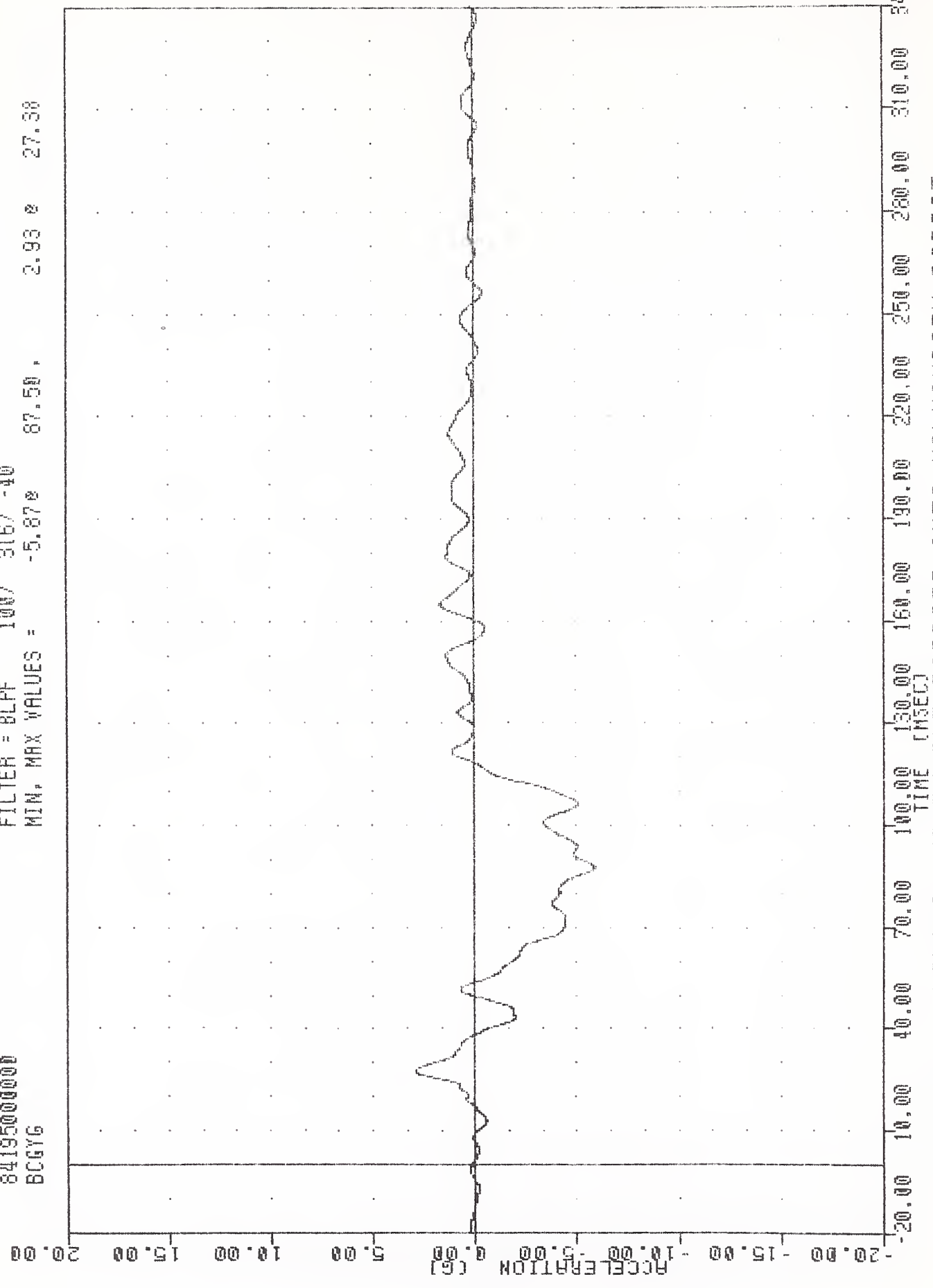
PLU1 UNID 30-JUL-84 12:04:30

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -12.928 57.50 0.29 258.88



THU , 840/13
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 BCGYG
 PLOT DATE 30-JUL-84 12:04:50
 FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -5.878 87.50 , 2.93 27.38



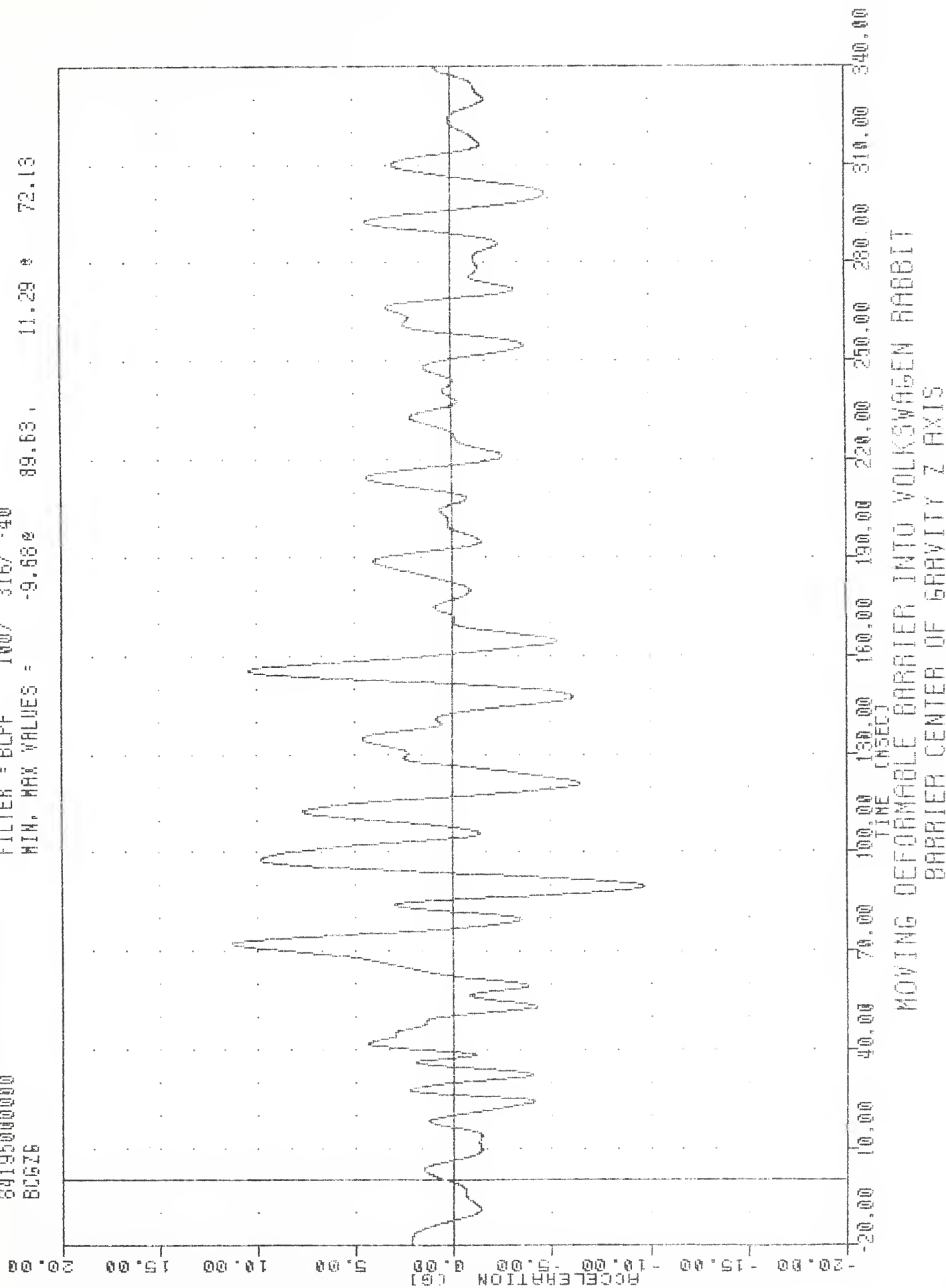
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 BARRIER CENTER OF GRAVITY Y AXIS

INC 840713
 SIDE AGGRESSIVE ATTRIBUTES
 841950000000
 BCGZ6

PLOT DATE 30-JUL-84 12:04:50

FILTER = BLPF 100/ 316/ -40

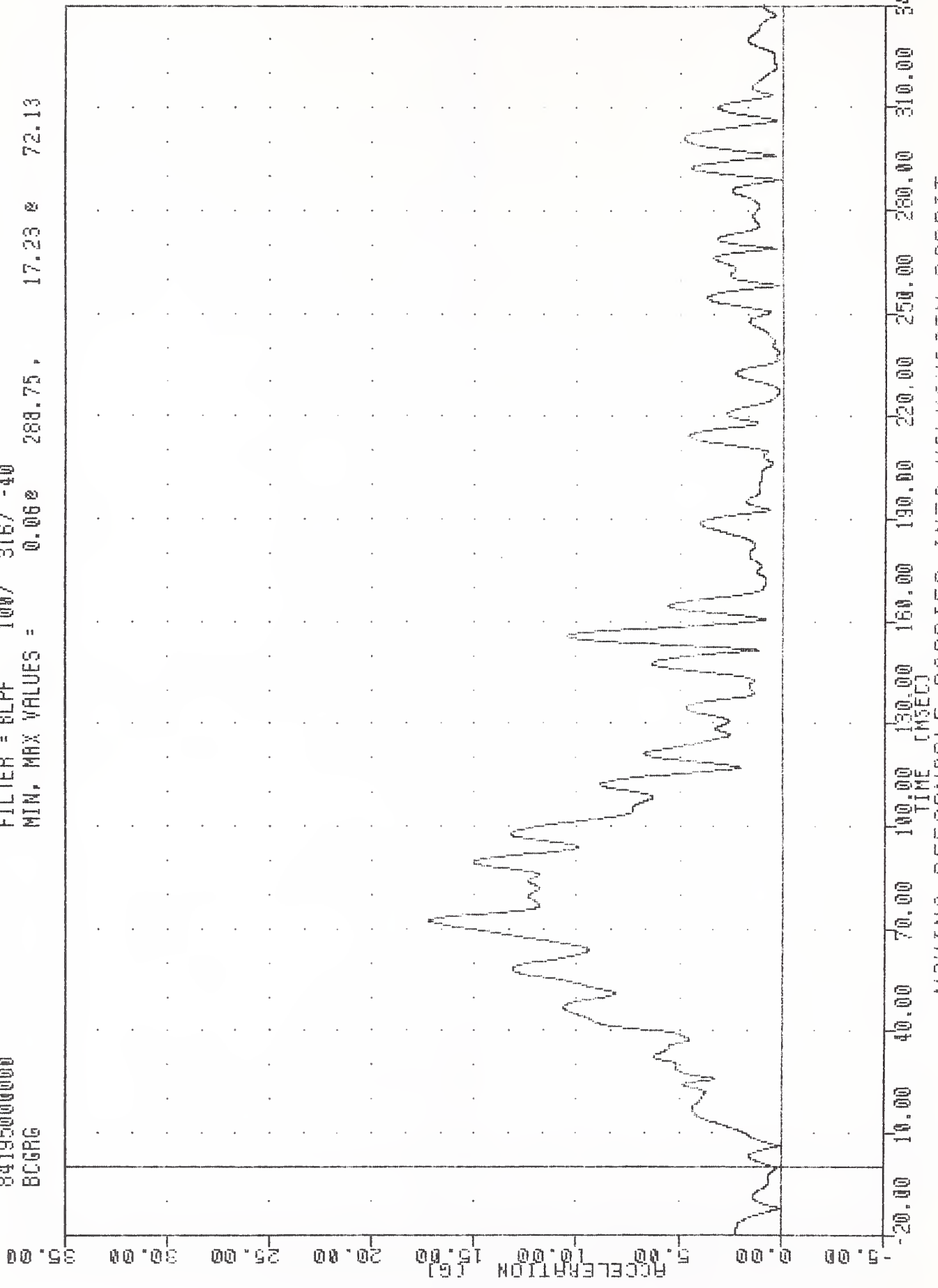
MIN. MAX VALUES = -9.68 89.63 11.29 72.13



TRC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 BCGRG

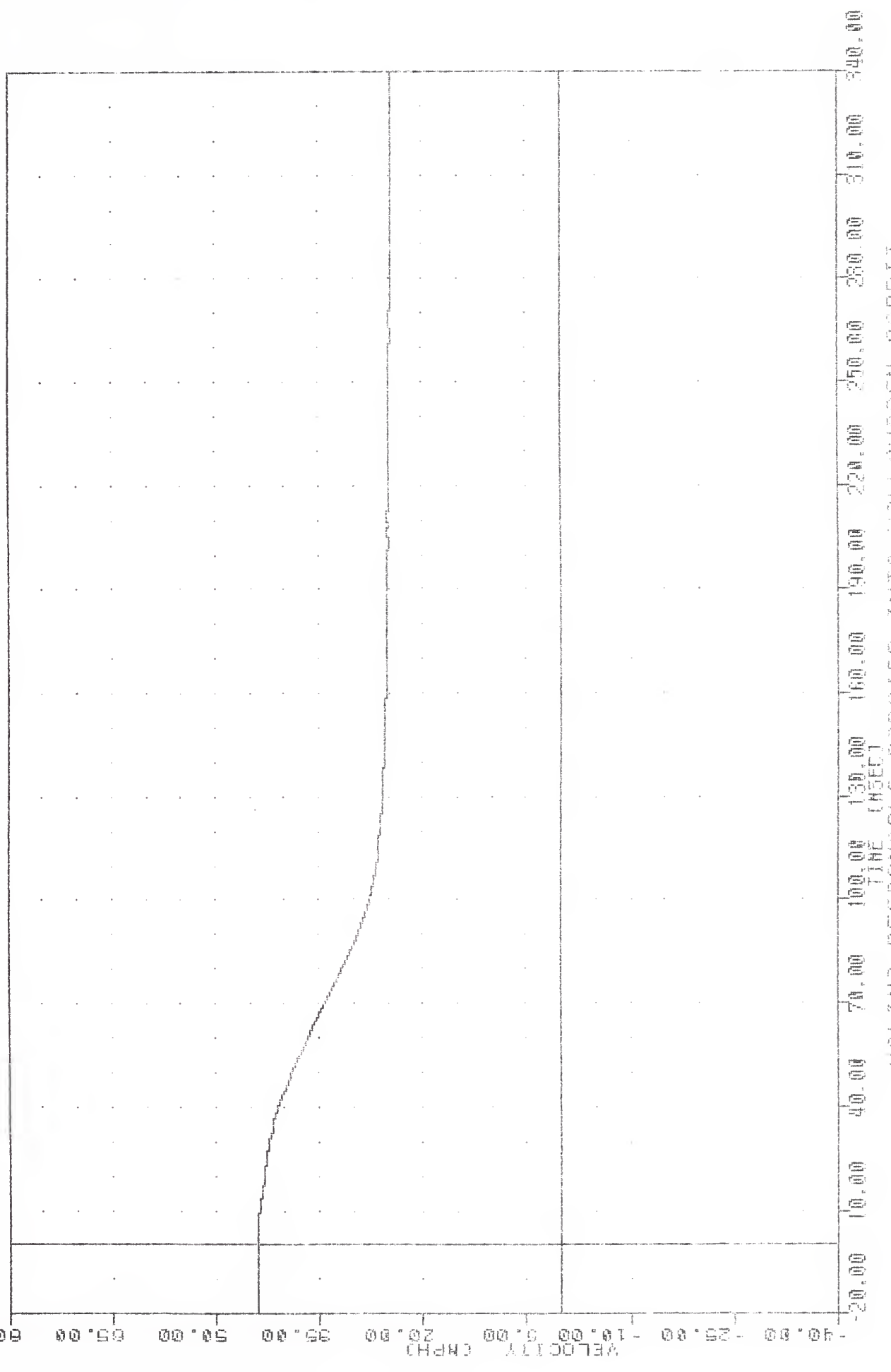
PLOT DATE 30-JUL-84 11:17:16

FILTER = 8LPF 100/ 316/ -40
 MIN, MAX VALUES = 0.060 288.75, 17.23 & 72.13



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 BARRIER CG RESULTANT

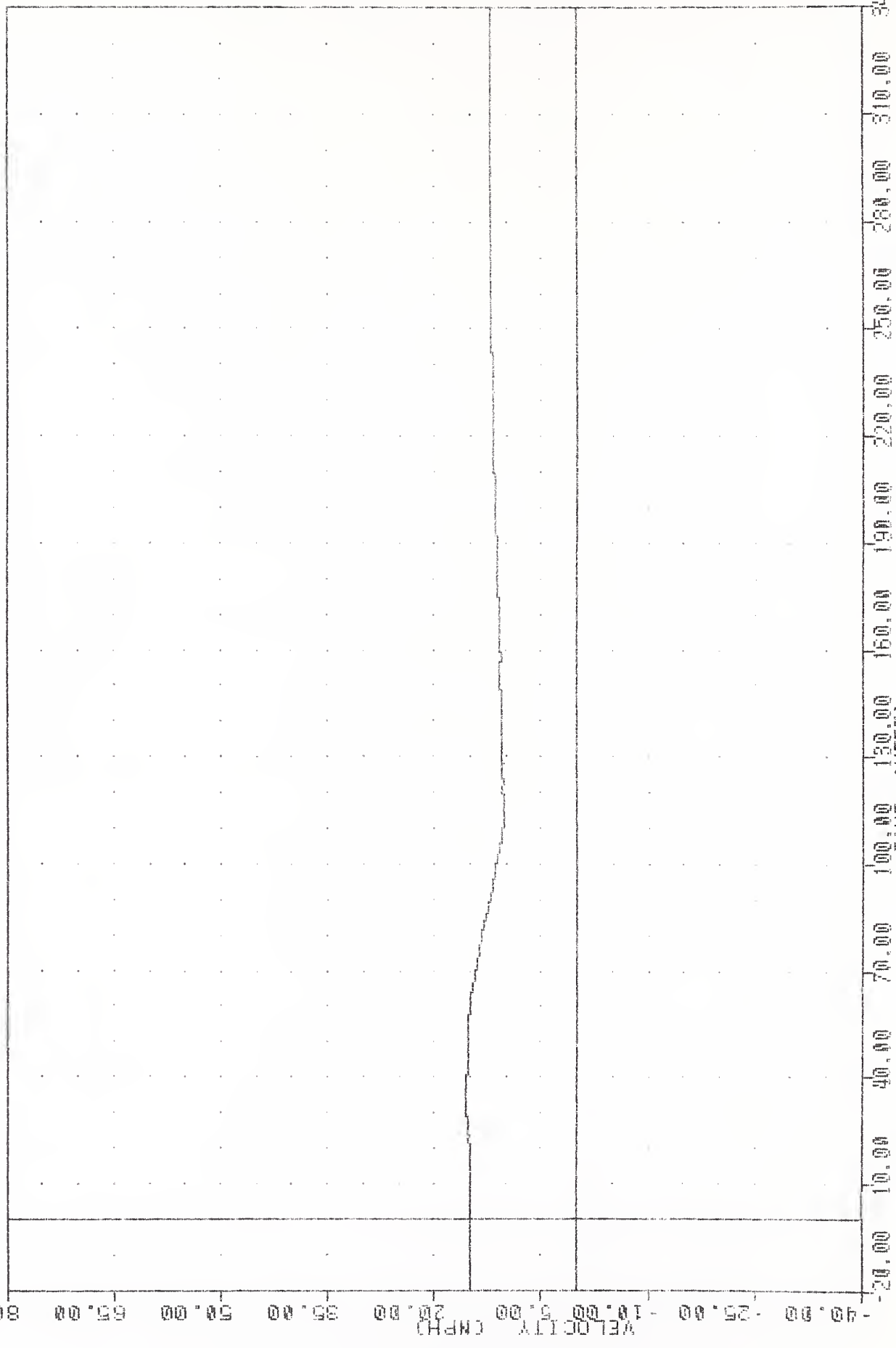
THC , 840713 PLUT DATE 13-AUG-84 14:15:43
 SIDE AGGRESSIVE ATTRIBUTES
 841950000000
 BCGXV
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = 24.43 340.00 43.90 -20.00



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING BCGXG

IRC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 841950000000
 BCGYV

PLU DATE 13-HUG-84 14:15:43
 FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = 10.26 115.00, 15.61 35.75



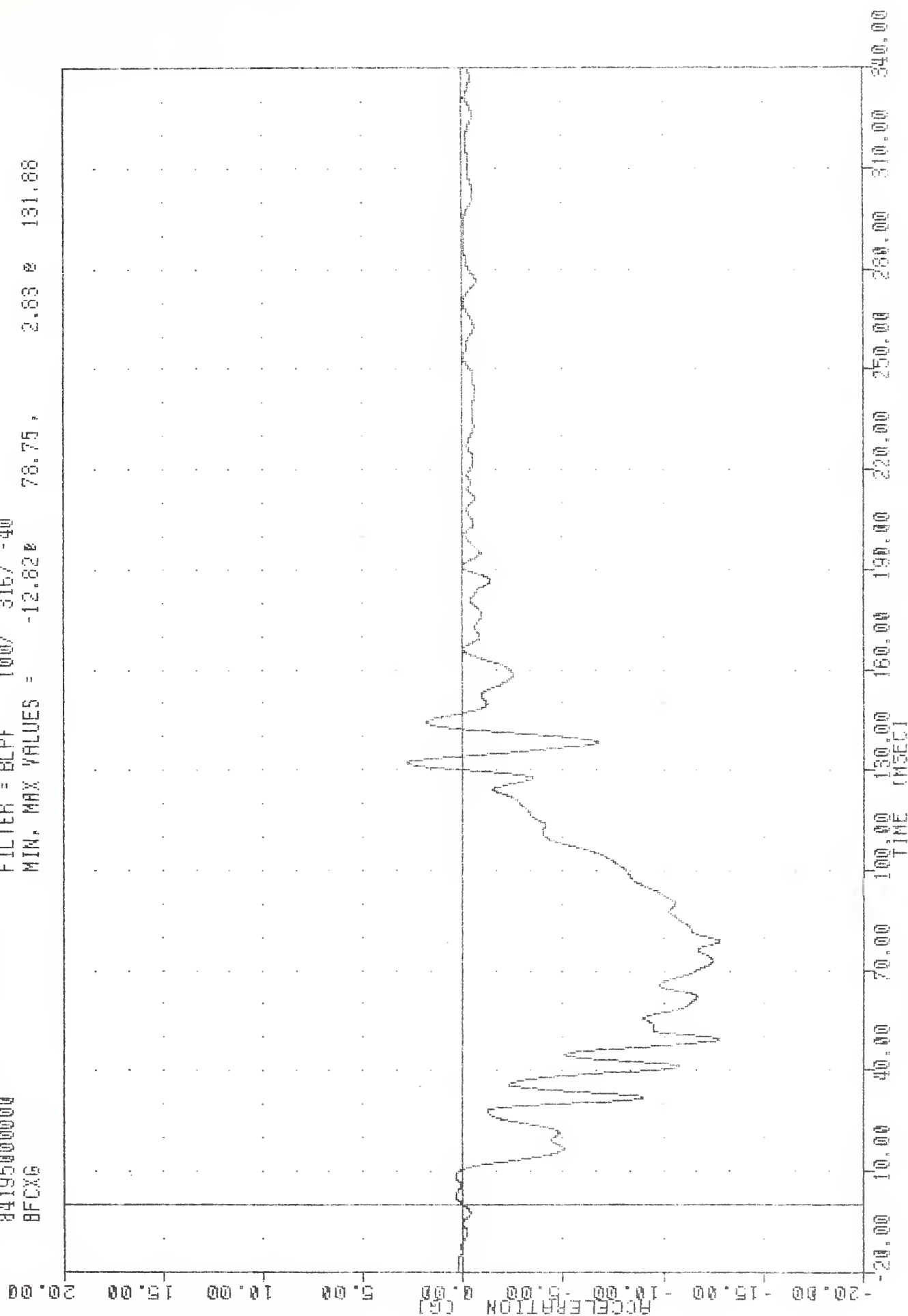
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING BCGYV

TRC , 840/13
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 BFCXG

PLU1 DATE 30-JUL-84 12:04:50

FILTER = BLPF 100/ 316/ -40

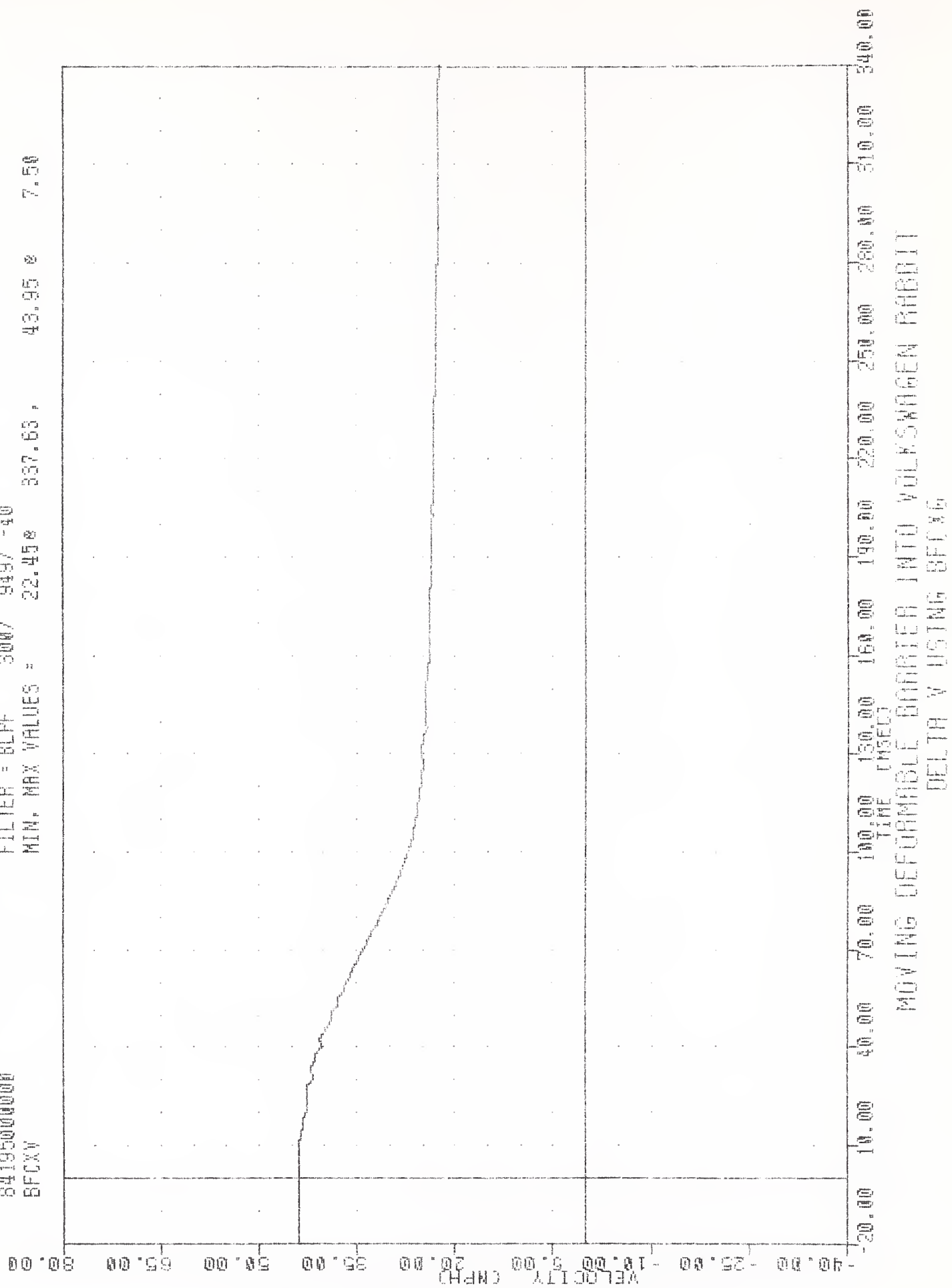
MIN. MAX VALUES = -12.820 78.75, 2.83 0 131.88



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 BARRIER FRONT CROSSMEMBER ACCELERATION X AXIS

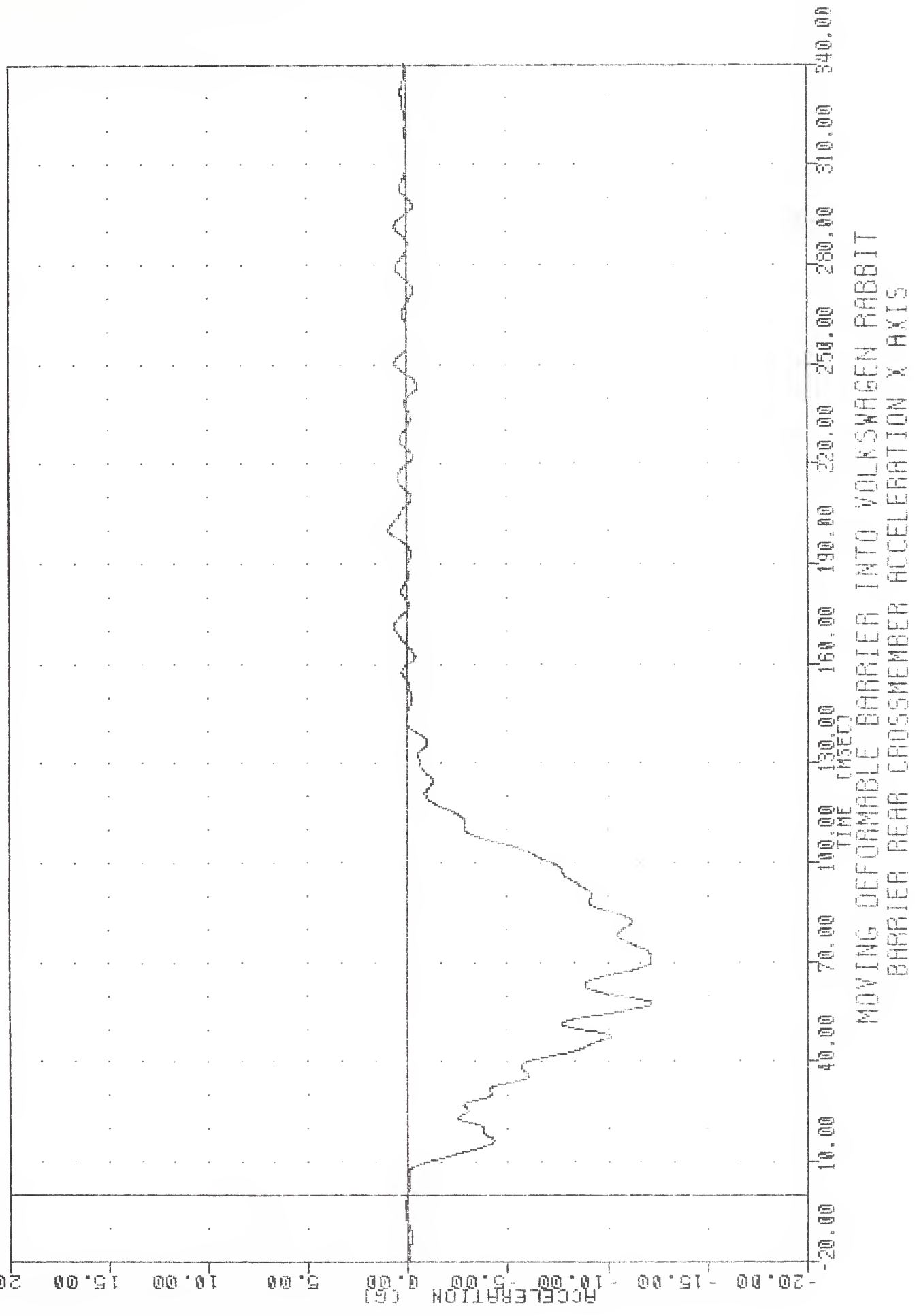
THL 840713
 SIDE AGGRESSIVE ATTRIBUTES
 841950000000
 BFCXV

PLU1 DATE 18-HUG-84 14:15:43
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = 22.458 337.63, 43.95 7.50



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING BFCXG

TPC , 840713
 SIDE AGGRESSIVE ATTRIBUTES
 841950000000
 BRDVG
 FILTER = BLFF 100/ 316/ -40
 MIN. MAX VALUES = -12.228 57.38 , 0.95 & 200.00
 PLOT DATE 30-JUL-84 12:04:50



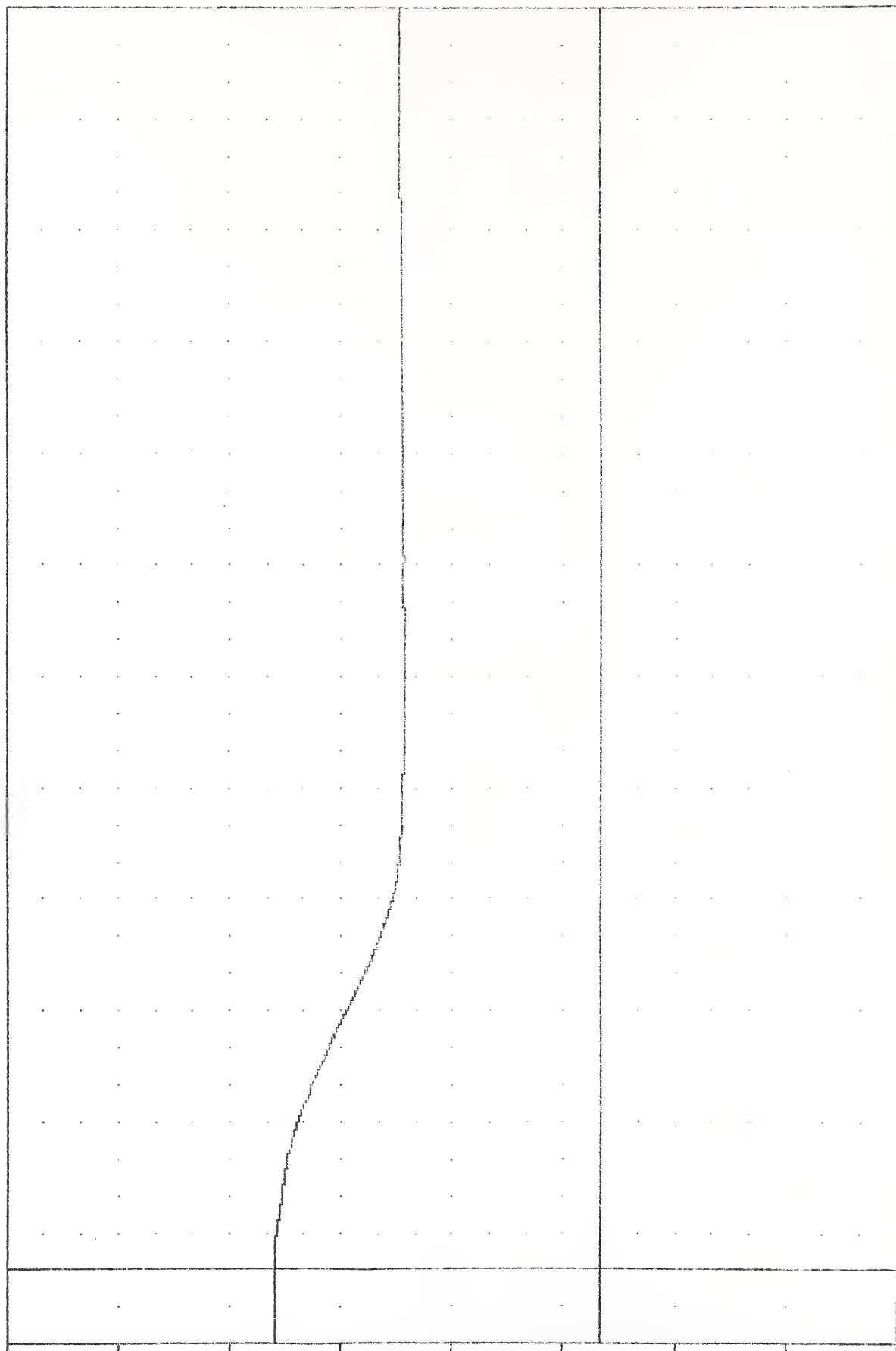
INL 040/13
 SIDE AGGRESSIVE ATTRIBUTES
 84195000000
 BRXXV

FLU1 UNIT 13-MAR-84 14:15:43

FILTER = BLFF 300/ 949/ -40

MIN. MAX VALUES = 26.490 160.63 43.90 -20.00

VELOCITY (MPH)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING BRXXG

TL 242 .B4

Bell, L. 1

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attribute

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